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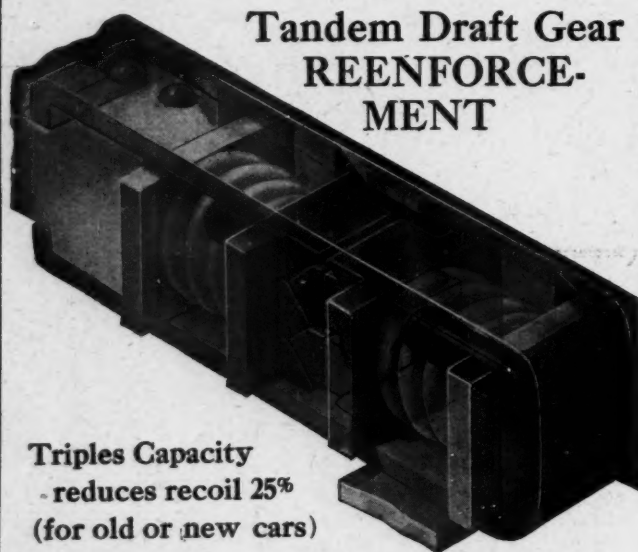
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Railway Age Gazette

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GENERAL NEWS SECTION

*Illustrated.

A sedulous effort has been made recently to mislead the public into believing that the managers of the railways suddenly have changed their attitude regarding the Adamson eight-hour pay day law. One reading what has appeared in a number of newspapers would be led to think that all thought of contesting the law in the courts had been abandoned; that the roads were now disposed to lick the hand that recently swatted them, and that all they ask now is the privilege of passing the burden of the increase in wages along to the dear public. All such reports are baseless fabrications, and they are probably sent abroad for political purposes. There are, of course, some railway managers who hold different views from the great majority, but it can be stated with the utmost emphasis that the great majority of them still regard the way the Adamson law was jammed through as outrageous in every respect, and still consider the law itself as an unrighteous imposition on the railways and the American public. Of course, now that the law is in effect, what steps shall be taken with reference to it is a matter for careful and thorough consideration, but to say that the railways have abandoned the struggle against the counterfeit eight-hour day which the brotherhoods and the politicians have tried to force upon them is grossly misleading. If the railway managers should quit the fight at this stage of the game, with all the repudiation of their past professions and the abandonment of sound principles which this would involve, they would merit, and they know they would merit, the contempt of every self-respecting American citizen.

Railway officers expect and endeavor to create increased traffic from year to year. They expect that sooner or later grades will have to be reduced, second track will have to be laid and various other improvements carried out in order adequately to take care of increasing business. It would seem the part of wisdom for the railways to have their mechanical departments make similar preparations for the future. Increased tonnage will require heavier locomotives, higher

capacity cars will be demanded, and for both cars and locomotives improved shop facilities will be essential if they are to return adequate service. The mechanical department should be in a position to study not only the present operating conditions, but the probable conditions of several years from now. If its officers are so situated that they can do this, carefully studying the present motive power and car equipment and preparing designs for equipment of greater capacity for the future, they will be prepared, when it is decided that the time has come for the introduction of such equipment, to present designs which will produce with the greatest economy the results desired instead of having to call upon the manufacturers to hurriedly build locomotives and cars from designs prepared on short notice. It may be said that the builders are better equipped than the railways to produce good equipment designs. With conditions as they are at present, this is undoubtedly true; but it should not be. The officers who are in charge of a railway ought to be more familiar with what is required to make it produce the maximum net revenue than any outsider, and if the mechanical department is provided with an adequate appropriation—an appropriation that would permit of a sufficient number of capable officers and men to effectively carry out the necessary work of supervision, designing and testing—a constructive program of preparation for the road's future needs can be carried out. It is worth while to cite the example of the Pennsylvania Railroad. The work done by its mechanical department in producing locomotives and cars to most effectively and at the same time economically conduct the road's transportation has not only had its effect in improving the conditions on the Pennsylvania, but on all the railways of this continent. It is not intended to suggest that every American railway can or should have a test department as elaborately fitted out as that at Altoona, but every American railway should have a capably manned and organized mechanical department and such a department can accomplish a great deal toward improving any railway's operating conditions even with facilities considerably less than those of the Pennsylvania. What executive officers have got to realize, if they are going to get the most effective work from their mechanical department, is that it must be so con-

ducted that its officers will not need to spend all of their time in settling matters that are picayune, and many of which could be adequately taken care of by an assistant mechanical engineer or a chief draftsman. The mechanical department of the Pennsylvania Railroad is not organized or conducted on the basis of today's requirements only; the future of the road is as much looked after in this department as in any other and the same condition should obtain in the mechanical department of every American railway.

REASONABLE FREIGHT RATES (TEX.)

THE famous Shreveport rate case, in which the freight rates that constitute an important factor in the commercial life of at least two states have been juggled for three or four years between the railroads, the shippers, the Texas and Louisiana railroad commissions and the Interstate Commerce Commission and the federal circuit and Supreme courts, is again before the federal commission and the United States courts, on the petition of the Louisiana commission and of the railroads. If any special justification were needed at this time for the investigation of the entire subject of railroad regulation, about to be undertaken by the Newlands commission, the mere existence of the Texas Railroad Commission would be sufficient. Anyone who is at all in doubt as to the necessity for some change in the present method of regulating freight rates partly by state and partly by federal authority need look no further than a statement recently issued by Earle B. Mayfield, one of the members of that commission, in explanation of the reasons for the newest phase of the protracted Shreveport litigation.

It will doubtless be recalled that this case had its inception when the Louisiana Railroad Commission requested the Interstate Commerce Commission to remove a discrimination against the shippers of Shreveport, La. These shippers desired to sell goods in Texas, on the theory that it was all a part of the United States, but had been prevented from doing so with any great success by the fact that their competitors in Texas could ship to the same points on rates made, not for the benefit of the people of the United States, but, at least in theory, for the benefit of those of Texas.

After some litigation, several hearings and some experimentation the Interstate Commerce Commission has prescribed what it considers to be reasonable rates both from Shreveport and from Texas points to the same destinations, which, needless to say, are somewhat higher than the rates made in Texas by Texans and for Texans. It is understood that the railroads were prepared to put these rates into effect on November 1.

As to the principal facts in the present phase of the controversy there seems to be little dispute. During the hearings which preceded the latest decision of the Interstate Commerce Commission in the case, rendered on July 7, the Texas railroads agreed voluntarily to establish between Shreveport and Texas points rates on a given list of commodities which had been fixed by the Texas commission and which the roads considered more nearly reasonable than the rates they were accustomed to because they had recently been advanced by the Texas commission by about 10 per cent. In view of this agreement the Interstate Commerce Commission, when it ordered other Texas rates advanced to avoid discrimination against Louisiana shippers, made no specific finding as to the rates agreed upon. But, apparently in a fit of pique because the railroads were not satisfied with certain other rates made by the Texas commission, that body on August 28 withdrew the advances which it had allowed after a year of investigation and by an order effective on September 1 restored the old rates which the roads had been trying for two years to have raised by 15 per cent. The roads have secured a restraining order from Judge Pardee of the United States court and the Louisiana Railroad Com-

mission has petitioned the Interstate Commerce Commission to make a specific order as to the rates in question.

Commissioner Mayfield has issued a statement of some three or four newspaper columns to explain that the action of the commission in withdrawing the advances it had allowed "was not one of retaliation," that "the Railroad Commission of Texas does not conduct business along any such lines," but that it was based on "good reasons" which "on account of the injunction it would not be prudent to discuss." He does not mind admitting, however, in order to be "frank and honest with the people of Texas," that its order increasing certain rates was made, not because it wanted to raise rates, or because it believed the rates were too low for the health of Texas commercial interests, but was "due to the fact that the Shreveport case was standing constantly before us like Banquo's ghost and would not down;" that in the long run it would be much better and cheaper for the people of Texas to stand a reasonable (Tex.) increase in rates "than to run the risk of having much higher rates forced on the people of Texas in case the courts should decide against us."

The railroad attorneys had told the Texas commission, he says, that if it would give them reasonable rates they would just as soon work under them as under Interstate Commerce Commission rates, and that they had no desire to prolong the Shreveport litigation. Therefore, Mr. Mayfield charges, "the railroads broke faith with the commission," when they decided to accept the rates fixed by the Interstate Commerce Commission in preference to some which had been fixed by the Texas commission and not included in the agreement as to the specific list of commodities. This reason for the commission's cancellation of the advances it had approved Mr. Mayfield feels "can be discussed" in spite of the injunction.

Mr. Mayfield's statement reviews in detail the entire history of the Shreveport case. Two of the railroad attorneys have issued another long statement in reply to it. In many respects the commissioner's statement is a more convincing refutation of its own arguments than the other is. He is so explicit and frank except on the main points on which his argument rests that attention is at once fixed on the absence of details when he gets down to his charges of "double-crossing." A vital point in the argument seems to depend on the definition of the word "reasonable." The railroads said that if the Texas commission would give them "reasonable" rates they would accept them. The Texas commission made some "reasonable" rates and the Interstate Commerce Commission made some more "reasonable" rates. The railroads appear to have preferred the rule of reason applied by the Interstate Commerce Commission, thereby "breaking faith with the Texas commission, which thereupon issued an order saying that rates 10 per cent lower than the ones it had just made would be "reasonable" after September 1.

Commissioner Mayfield explains the situation very clearly. He says: "The Texas commission's maximum rate on first-class freight was 80 cents. The Interstate Commerce Commission had already told the Texas railroads they could charge as high a rate as \$1.06 on first class freight in that part of Texas east of a line drawn from Gainesville down through Fort Worth via the Brazos river to the Gulf of Mexico, and the Louisiana interests had petitioned the Interstate Commerce Commission to enlarge its order and spread this \$1.06 rate over the entire state of Texas. We had a well-grounded suspicion that the Interstate Commerce Commission would make the attempt.

"The Texas commission raised its rate on first-class freight to 90 cents, expecting that the railroads would do what they had said they would do, viz.: put that 90-cent rate in between Shreveport and Texas points and thus eliminate the entire Shreveport controversy. It was our opinion that it would be cheaper for the people of Texas to pay the 90-cent rate than to experience four or five years of expensive rate

litigation and turmoil and at the same time take the chance of having a \$1.06 rate saddled on their backs in the end by a federal court. Upon this theory the Texas commission proceeded to revise and readjust a number of its tariffs and issued rates that were more than fair and reasonable to the Texas railroads, with the expectation that the carriers would apply said rates between Shreveport and Texas points and thus put to an end a controversy that surely would be fruitful of nothing except ill results to the people of Texas.

"On July 7, 1916, the Interstate Commerce Commission rendered a final decision in the Shreveport case and did exactly what we had expected it to do. It granted the new petition of Shreveport and undertook to control the rate situation of our entire state and said to the Texas railroads that they were at liberty to establish the \$1.06 rate on first-class freight throughout the state of Texas, provided they charged the same rate between Shreveport and Texas points, and also numerous other rates to apply on purely state traffic which were exceedingly higher than the increased rates granted by the Texas commission.

"The Texas commission had endeavored to be fair to the carriers and had even thought it had been liberal, but it appears that the carriers have not thought so. There is going to be long and expensive litigation; confusion will exist as to what are the proper rates and commercial conditions will be greatly disturbed. The Texas commission sought to avoid that very situation and went more than half way to meet the exigencies of the case. Let the responsibility rest where it should—on the shoulders of the Texas railroads."

If the Texas commission "went more than half way" in its labored efforts to be reasonable, Mr. Mayfield has chosen an unfortunate illustration. Half way from 80 cents to \$1.06 would be somewhat more than 90 cents. But he also explains in detail with what travail the Texas commission managed to persuade itself to go as far as it did. On January 26, 1914, he says, the Texas railroads filed their application for a 15 per cent general increase in freight rates throughout the state. The commission, on August 26, issued notice of a hearing thereon. The hearing was postponed and finally set for March 4, 1915, and on that date was begun. Some adjournments were taken, but on September 1, 1915, the hearings were resumed. They consumed several weeks. The railroad attorneys were given the widest latitude in cross-examination of the commission's experts, thereby seriously delaying the otherwise swift course of Texas justice. Mr. Mayfield recalls "how the patience of the commission was taxed by the cross-examination of Mr. Emerson, which lasted five or six days, and the efforts made to humiliate this brilliant young efficiency expert." On October 26, 1915, the final hearing was held for the purpose of hearing argument. "No tribunal intrusted with similar powers ever conducted a more thorough investigation or ever gave more careful consideration to matters at issue."

During all this time the Shreveport case was pending before the Interstate Commerce Commission. The special counsel of the Texas commission filed a motion in September that further hearing of the Texas case be indefinitely postponed because the roads "were seeking to get their increase in rates from the Interstate Commerce Commission while denying the jurisdiction of the Texas commission to control the very rates which they had petitioned the commission to advance." With infinite patience, however, the Texas commission continued its efforts to be reasonable, even liberal. It dismissed the motion to postpone. In December while the Texas case was still "under advisement and consideration" the Interstate Commerce Commission hearing came on at Houston. Not as a party to the case, but as an innocent bystander. Mr. Mayfield attended and "witnessed the spectacle of the Texas railroads presenting

for the consideration of the Interstate Commerce Commission greatly increased tariffs to apply on purely state traffic." They even "at great expense" had prepared and introduced "every particle of evidence that had been presented to the Texas commission."

That was too much. Mr. Mayfield could bear his cross no longer. He did not hesitate to state that the Texas commission had nothing further to consider and that it would dismiss the case. Mr. Mayfield is telling the story and we do not know what the other Texas commissioners were doing at this time.

But hope springs eternal in the human breast. The commission was again patient. On January 12, 1916, it received a letter from Messrs. Terry and Garwood, the railroad attorneys, saying: "If this commission (Texas) shall see fit to install just and reasonable tariffs it will be the endeavor of the carriers to install the same tariffs to and from Shreveport. Should this be done, the Shreveport case is of course eliminated."

"Taking this suggestion of the attorneys of the railroads as made in good faith," the Texas commission "proceeded to make certain changes in its rates." Two years after the application of the railroads was filed it decided to beat the Interstate Commerce Commission to it—to appease "Banquo's ghost." "With a desire to be fair to the railroads and at the same time to carefully guard the interests of the people," after weeping and wailing and gnashing of teeth, the Texas commission decided to advance some rates. Some more than others apparently, because the railroads agreed to accept some, but as to the others continued to present their evidence to the Interstate Commerce Commission.

The Interstate Commerce Commission "did exactly as we had expected it to," says Mr. Mayfield. The greedy railroads did just what anyone would have expected them to do and the Texas commission did just what might have been expected of it. It welched. Mr. Mayfield is "frank to say" that he proposed that the Texas commission "wipe the slate clean and meet the attack in the manner it deserves to be met." The injunction "will be fought out and determined in the courts." But Mr. Mayfield has one more grievance. "There is, of course, a chance for the Texas commission to lose, and, if it should, the higher rates granted by the Interstate Commerce Commission will be the lawful rates."

"Why go to Georgia for an injunction," he asks, "when there was Judge Burns of Houston, a fair and just judge, living just across the street from the railroad's general attorney? Why take this case from Texas borders to be tried?"

We have heretofore quoted entirely from Mr. Mayfield. Let us now give Messrs. Terry and Garwood a chance to reply to him. They say that Judge Burns, the only federal judge in the limits of the state, was at a distant point on his vacation, and that Judge Pardee, of Atlanta, Ga., is the senior circuit judge of the circuit which includes Texas. Otherwise they would have doubtless been pleased to patronize home industry.

"Banquo's ghost," which according to Shakespeare was seen only by the murderer, will not down. The Shreveport case is still with us. The "damned spot" is not yet "out." The Texas commission's confidence has been betrayed. Its liberality has been spurned and its motives have been impugned. Still worse, pending the injunction "it would not be prudent to discuss its real reasons." It must suffer in silence. The 90-cent rate which it thought might be cheaper than a \$1.06 rate, though more expensive than an 80-cent rate, is not so attractive in the eyes of the railroads that must pay Texas taxes and Texas damage suit lawyers as the \$1.06, which, while bearing the stamp of federal approval, is still good coin of the realm in the sovereign state of Texas.

PRESIDENT WILSON ON THE EIGHT-HOUR PAY DAY LAW

"Oh, what a tangled web we weave,
When first we practice to deceive."

PRESIDENT WILSON in a speech on September 23 offered his first defense of the Adamson eight-hour day law. It is painful to be obliged to charge the President of the United States with making a deliberate effort to mislead the people of the United States. This, however, is what Mr. Wilson did. He flatly misstated the facts as to what the train service employees demanded of the railways and by direct implication he as grossly misrepresented the provisions of the Adamson law. He was equally disingenuous in his statements regarding the circumstances under which this law was passed.

The President ascertained, he said, "that the points in controversy were very simple indeed; that the men demanded an eight-hour day, and that in order to make the eight-hour day work they demanded that the railroads pay them one-half more for overtime than they paid them for the time in the regular day." The men did not demand an eight-hour day, and President Wilson knows it. They did not demand any change whatever in their working hours. They merely demanded that they should be paid the same wage for eight hours' work as for ten hours' work, and that the railways should begin to pay them for overtime after the expiration of eight hours instead of after the expiration of ten hours. Under their plan thousands of employees might make a day's wage while working less, and even much less, than eight hours; thousands more, by running more than 100 miles in eight hours might make more than a day's wage in eight hours; and thousands more by running trains averaging more than 12½ miles an hour might work anywhere from eight to sixteen hours without receiving any overtime. Mr. Wilson knows not only that these men were not asking for a real eight-hour work day but that if the railways had proposed a day's wage for eight-hours' work, and also full eight hours' work for every day's wage the proposal would have been rejected.

Furthermore the President and Congress, by passing the Adamson law, did not as Mr. Wilson implies, provide for an eight-hour day. The Adamson law says on its face as plainly as the fact can be expressed in the English language that it is not an eight-hour *work* day law, but an eight-hour *pay* day law, and that if it goes into effect it will not necessarily reduce by one second the working day of a single human being.

It happens that the present national administration did recently put into effect on one railroad a real eight-hour work day, and it is illuminating to compare the language used in establishing this real eight-hour day on the Panama Railroad with the language used in providing for an eight-hour pay day on the railroads of the United States. We present below in parallel columns the language of the executive order made effective on September 1 on the Panama Railroad and the language of the Adamson law providing for an eight-hour pay day on the railroads of the United States.

ON THE PANAMA RAILROAD
"Effective September 1 the working day for train crews and switching engine crews will be limited to eight hours except in cases of emergency when authority for overtime must be obtained through the proper channels either from the executive office or from the superintendent of the Panama Railroad."—Extract from order issued by Col. Goethals as Governor of the Canal and President of the Panama Canal.

ON UNITED STATES RAILROADS
"Beginning January 1, 1917, eight hours shall in contracts for labor and service be deemed a day's work for the purpose of reckoning the compensation for service of all employees . . . engaged in any capacity in the operation of trains. . . . For all necessary time in excess of eight hours, such employees shall be paid at a rate not less than the pro-rata rate."—Verbatim provisions of Adamson Law.

On the Panama Railroad the Government of the United States says that the working day will be limited to eight

hours, except in cases of emergency. There can be no question about the meaning of that. It establishes a real eight-hour day. As to the railroads of the United States the Government says, in the Adamson law, "That eight hours shall be deemed a day's work" for one purpose, and one only, namely, for the purpose of reckoning compensation. Why did Congress pass the law in this form, instead of providing, as Governor Goethals did at Panama, that eight hours should be a day's work except in cases of emergency? Simply because the Brotherhoods demanded that the legislation should be given this form. And they demanded that it be given this form because this would give them an increase of wages, and that is all they were seeking. President Wilson went on to say: "We believe in the eight-hour day because a man does better work within eight hours than he does within a more extended day. * * * His spirit and his work are improved, and the moral and physical vigor of the man is added to."

It may be true that men in railway train service who now work more than eight hours would be better off if their working day were limited to eight hours. It may be true that the public welfare demands that the working day of these men should be restricted, as it has been on the Panama Railroad, to eight hours except in cases of emergency. If so, then Congress deliberately disregarded the interests of these men and of the public. What the men needed, on this theory, was a reduction in their working hours. What Congress gave them was an increase in wages. What the public welfare demanded, on this theory, was that the working hours of these men should be reduced. What the government actually did was not to reduce their working hours, but to burden the public with an increase in their pay.

President Wilson also said that "these men (the representatives of the railways and the brotherhoods) were dealing with one another as if the only thing to settle was between themselves, whereas the real thing to settle was what rights had the 100,000,000 people of the United States." How could he make such a statement when he knows that the railways repeatedly demanded arbitration on the ground that the public was the chief party concerned, and therefore had a right to have the controversy settled by some impartial board representing itself? The President attempted to make it appear that the government in jamming through the Adamson law was not influenced so much by fear of a strike as it was by the belief that the legislation was right. Such statements are so contrary to the facts that they sound like irony.

It is highly significant that Democratic writers and speakers, led by President Wilson, are deliberately avoiding discussion of the actual provisions of the Adamson pay day law, and devoting themselves to academic discussions of the merits of an eight-hour day. No better evidence could be afforded that the actual provisions of the Adamson law cannot be defended before the bar of public opinion.

RAILWAYS EARNED 5.6 PER CENT IN 1916

WHEN the prosperity of the railroads during the fiscal year just closed is stated in terms of the return earned on the investment in property devoted to the service of the public the results are less striking than those obtained by comparing the gross and net earnings with those of previous years. In last week's issue it was shown that the chief difference in the results for 1916 and for 1913, which was the last prosperous year which the railroads had, lay in the success with which the managements were able to hold down operating expenses. It should be noted also that while the earnings of the roads were the largest in their history, the capital investment on which they must earn a return if they are to continue to attract capital into the business was also the largest in their history.

The Interstate Commerce Commission has not yet reported the property investment for 1916, but if, as may be conservatively assumed, it increased as fast in proportion during the past year as it did during the preceding four years it amounted on June 30, 1916, to \$79,559 per mile, for the roads earning over \$1,000,000 a year, and the operating income of \$4,490 per mile earned during 1916 by these roads represents a return of only 5.6 per cent on this investment. In 1907 the railways earned 5.83 per cent out of total revenues of only \$2,589,000,000, as compared with \$3,397,000,000 in 1916. But from 1907 to 1915 alone the property investment, according to the Interstate Commerce Commission's reports, increased from \$13,030,000,000 to \$17,247,000,000, or over \$4,000,000,000.

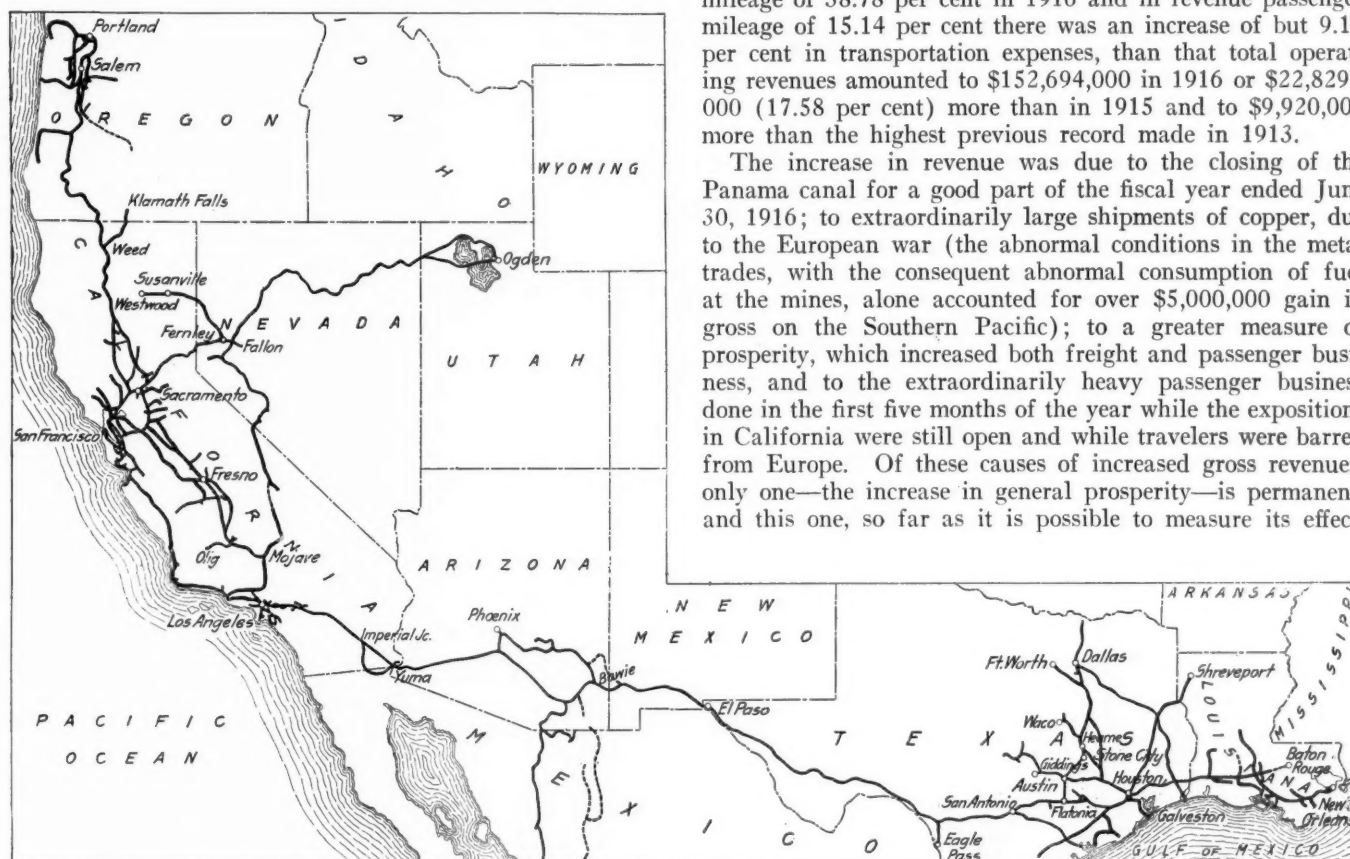
While this was an amount less than should have been expended to enable the roads to keep pace with the progress of the country, it was at the rate of about \$500,000,000 a year. A return of 5.6 per cent on the investment in the year of the largest gross and net earnings the railroads ever enjoyed seems exceedingly modest, especially when it is considered in connection with the fact that it follows years

20 to 30 per cent on their capitalization and the head of one of the large steel companies was recently quoted in the Wall Street Journal as saying that many of the steel companies could pay dividends for the next 10 years out of their surplus earnings after the present period of prosperity is over without earning another dollar. Railroad investments are hardly to be compared with such cases as these, but the comparison indicates the foolishness of regarding the present earnings of the railways as especially enormous.

SOUTHERN PACIFIC

THE largest operating income in the history of the Southern Pacific—that earned in the fiscal year ended June 30, 1916—was the result of an extraordinary increase in gross earnings from causes many of which are temporary and from gains in operating efficiency which, if they can be maintained, are a much sounder bull point on Southern Pacific stock than the record gross earnings. In the long run it is a much more favorable indication of the Southern Pacific's earning power that with an increase in revenue ton mileage of 38.78 per cent in 1916 and in revenue passenger mileage of 15.14 per cent there was an increase of but 9.14 per cent in transportation expenses, than that total operating revenues amounted to \$152,694,000 in 1916 or \$22,829,000 (17.58 per cent) more than in 1915 and to \$9,920,000 more than the highest previous record made in 1913.

The increase in revenue was due to the closing of the Panama canal for a good part of the fiscal year ended June 30, 1916; to extraordinarily large shipments of copper, due to the European war (the abnormal conditions in the metal trades, with the consequent abnormal consumption of fuel at the mines, alone accounted for over \$5,000,000 gain in gross on the Southern Pacific); to a greater measure of prosperity, which increased both freight and passenger business, and to the extraordinarily heavy passenger business done in the first five months of the year while the expositions in California were still open and while travelers were barred from Europe. Of these causes of increased gross revenues, only one—the increase in general prosperity—is permanent, and this one, so far as it is possible to measure its effect,



The Southern Pacific

in which the return was very much less. In 1915 the rate of return on property investment was only 4.04 per cent and in 1914 it was only 3.94 per cent, while even in 1913 it was only 4.83 per cent.

A rate of 5.6 per cent is insignificant indeed when compared with some of the profits that are being garnered during the present period of prosperity by industrial companies, particularly in the automobile and steel businesses. The recent report of the Ford Motor Company for the year showed net earnings of nearly \$60,000,000 or 3,000 per cent on its capitalization of \$2,000,000. This company was able to pay a dividend of 60 per cent and still retain a surplus for the year for reinvestment in the business of over \$58,000,000. Several other automobile companies have earned from

directly accounts for a smaller percentage of gain in gross than any one of the other causes named. The full measure of the increase in business done is not shown by the percentage of increase of gross revenue. The average ton-mile rate received by the Southern Pacific was 9.77 mills in 1916, comparing with 10.99 mills in 1915, a decrease of 11.10 per cent. The average revenue per passenger per mile was 2.069 cents in 1916, comparing with 2.173 cents in 1915, a decrease of 4.79 per cent. The decrease in the ton-mile rate is the result of the much larger proportion of low grade traffic carried and the decrease in the passenger-mile rate is apparently in part due to the greater proportion of long haul business, probably done at excursion rates.

If there were no qualifying factors to the progress made

by the operating organization in effecting more economical movement of freight and passengers and to the standard of upkeep which the Southern Pacific has attained it would be hard to over-rate the value of these factors as indications of the great prosperity which the company should enjoy. The Southern Pacific is a magnificent transportation machine for long haul business, which machine even in 1916 had not, except in some few comparatively unimportant instances, reached by any means its limit of handling increased business at a decreased ratio of transportation expenses to gross, other factors remaining the same. An average daily freight car mileage of 34.96 miles (a gain of 26.44 per cent over 1915); an average loading per loaded freight car of 22.89 tons (a gain of 10.15 per cent over 1915); an average trainload of 526 tons (a gain of 13.50 per cent), and a reduction of 32.01 per cent in payments for loss and damage to freight, despite an increase of 38.78 per cent in revenue ton mileage, are pretty clear indications that the Southern Pacific has a management and organization capable of developing the potentialities of the property. There are indications, however, that the management thinks that with a trend of conditions as they are now it is fast approaching the limit of further operating economies. The prices of materials have gone up to an astonishing extent—Pacific type locomotives 30 per cent since 1913; tank cars, 28 per cent; plate girder bridges, 97 per cent; journal bearings, 99 per cent; bar iron, 143 per cent. If the wages of enginemen, firemen, conductors and brakemen are increased, as is the intention of the Wilson-Adamson bill, this will add \$2,500,000 absolutely unproductive expense to the Southern Pacific's transportation expenses alone. There may be larger increases in wages.

An estimate of the relative weight of the forces which are at play in the Southern Pacific situation would be little more than pure guesswork. Panama canal competition may or may not take away more traffic from the Southern Pacific than a sustained period of general prosperity will bring to the road. Heavy shipments of ores and mineral products may quite possibly continue for a very considerable period, even after the termination of the present European war. On the other hand, the high prices of materials may also continue, which would make expansion of facilities extremely costly.

In the meantime the physical condition of the property is being maintained at a very high standard. At the close of the fiscal year there were 15 per cent fewer locomotives and 50 per cent fewer freight cars awaiting repairs than at the end of the previous year. With a single exception, the Southern Pacific has not killed a passenger in train accidents for seven years and 11 months, and with a movement of 60,703,000 locomotive-miles during the year only 10 employees lost their lives in train accidents.

The financial resources of the Southern Pacific are enormous. During 1916 \$31,259,000 was invested in additions to and betterments of the property, while the outstanding funded debt of the company was reduced by approximately \$2,000,000. Cash on hand and on deposit as of June 30, 1916, amounted to \$18,528,000, or \$2,220,000 more than at the beginning of the year, and there were no loans and bills payable.

In addition to the assets shown on its balance sheet, the Southern Pacific has an interest in oil lands which, if its title is upheld by the Supreme Court, will add very greatly to the value of its assets other than railroad property. It also has an interest in the Oregon & California Railroad's land grant, which, if the United States Supreme Court upholds the Southern Pacific's contention that it can sell the timber on this land separately from the land in all cases where it can sell the land without all or part of the timber on it at the maximum price prescribed in the land grant, will give it another very large asset not indicated on the balance sheet.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated.....	10,956	10,554
Freight revenue	\$98,567,886	\$80,020,751
Passenger revenue	40,338,316	36,864,998
Total operating revenues.....	152,694,228	129,865,675
Maintenance of way and structures	18,367,137	15,356,356
Maintenance of equipment.....	21,866,636	19,815,973
Traffic expenses	3,131,404	2,915,010
Transportation expenses	48,027,904	44,006,753
General expenses	3,913,399	3,955,027
Total operating expenses	97,443,658	87,753,842
Taxes	7,023,326	6,371,273
Operating income	48,189,971	35,689,614
Gross income	60,393,006	49,647,992
Net income	30,885,254	20,570,319
Sinking and reserve funds.....	934,838	939,725
Dividends	16,361,086	16,360,984
Surplus	13,589,330	3,269,610

ATCHISON, TOPEKA & SANTA FE

PRESIDENT RIPLEY comes to very much the same conclusion in regard to the increased revenues of the Santa Fe in 1916 as we express elsewhere in this issue in regard to the increased gross earnings of the Southern Pacific, namely, that "close analysis of operations for the year clearly indicates the enhanced earnings to be almost wholly due to the war in Europe." Whatever the causes, however, of the increase in gross earnings the Atchison, Topeka & Santa Fe, in spite of three disasters which in the terms of insurance policies were "acts of God," had a very prosperous year and earned net available for dividends \$32,580,000, comparing with \$24,131,000 net available for dividends in the year ended June 30, 1915. The 5 per cent on the preferred stock and 6 per cent on the common called for approximately \$18,600,000. Half of the remaining surplus of nearly \$14,000,000 was appropriated for additional investment in physical property and the remainder credited to profit and loss.

The three disasters which occurred on the Santa Fe were the Galveston flood, the explosion of a carload of gasoline at Ardmore, Okla., and rain storms in California and Arizona that washed out many miles of track and bridges and interrupted operation of some lines for a month. The extraordinary cost due to these three unfortunate events was about \$2,500,000, all of which is included in the operating expenses of the fiscal year ended June 30, 1916.

Total operating expenses amounted to \$83,731,000 in 1916, an increase as compared with the previous year of \$7,639,000. Of this increase approximately \$3,000,000 was for maintenance of way and structures, and in this item there must have been included a considerable part of the extraordinary expenditures caused by the two floods.

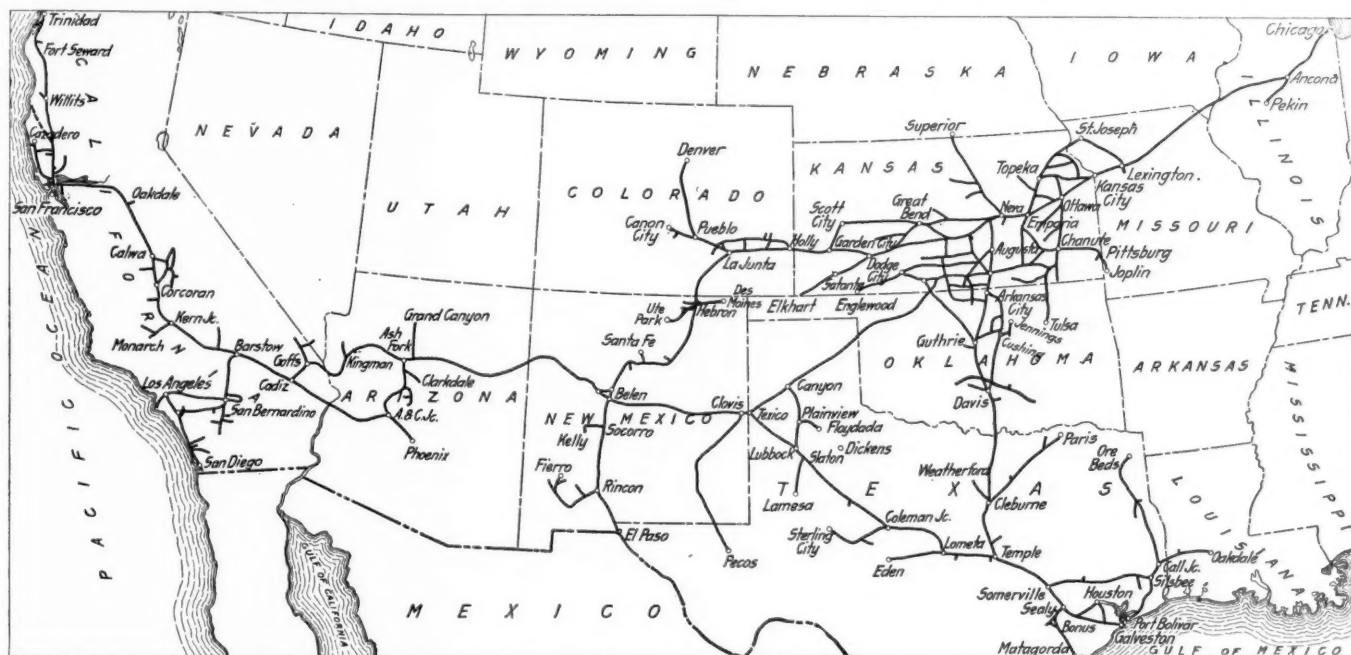
Transportation expenses amounted to \$38,281,000 in 1916, an increase of \$3,453,000. This is an increase of a little less than 10 per cent in transportation expenses and in this increase are included some of the extraordinary expenses due to the floods and the explosion of gasoline. The total ton mileage, including both revenue and company freight, in the fiscal year ended June 30, 1916, amounted to 11,465,000,000, which was 14.41 per cent more than the ton mileage in the previous year. The number of passengers carried one mile in 1916 was 1,584,000,000, or 18.10 per cent more than in the previous year. The average ton-mile rate received for freight was 9.29 mills in 1916 as against 9.74 mills in 1915, and the average receipts per passenger per mile were 1.992 cents in 1916 as against 2.074 cents in 1915. The average trainload in 1916 was 468 tons as against 442 tons in 1915. The length of haul for freight was about the same in both years—316 miles; but the average passenger journey was 106 miles in 1916, comparing with 92 miles in 1915. The gain in trainloading was helped by the larger proportion of low grade tonnage, the tonnage of ores and bullion totaling 4,648,000 in 1916 as against

2,759,000 in 1915. If a comparison between the trainload on the Santa Fe and on the Southern Pacific is made it should be borne in mind that on its New Orleans-Los Angeles line the Southern Pacific has no such heavy grades as the Santa Fe has over Raton Pass in New Mexico. On the other hand, the Southern Pacific has very heavy grades on some of the divisions north of San Francisco and climbs the Cascade mountains with its San Francisco-Salt Lake line.

Passenger business furnishes, when we include with it revenue from mail and express, a little less than a third of the total operating revenues of the Atchison, Topeka & Santa Fe. In 1916 passenger revenue proper amounted to \$31,569,000, an increase over the previous year of \$3,746,000, and mail and express revenue amounted to \$10,761,000, an increase over the previous year of \$1,423,000. This does not fully measure the increase in passenger business because, as has previously been mentioned, the average passenger-mile rate was lower in 1916 than in 1915, due to the larger proportion of tourist business carried at excursion rates. A part of the increase in passenger business in 1916 is accounted for by the San Diego and San Francisco fairs, but a part of it, President Ripley says, in his annual re-

conservative expenditure of over \$318,000,000 for extension and improvement to the property since 1896, and the fact that a considerable proportion of this expenditure was made with stockholders' money and no securities issued against it. Taking the investment as a whole, regardless of whether securities were issued to raise funds, or dividends were held down to permit the investment of surplus, the Santa Fe earned in 1916 the largest percentage in the history of the company, namely, 6.19 per cent. This is not a very high rate of return when it is remembered that from it must be paid not only bond interest and dividends but such capital expenditures as are necessary to maintain the credit of the company and earning power of the property. In 1916 the directors appropriated \$7,000,000 for this purpose, and the total amount spent for additions and betterments to property, exclusive of new construction and the purchase of fuel lands and real estate held for future purposes, was \$6,566,000.

During the year there were two sales of securities. The company sold \$10,000,000 preferred stock and an issue of \$5,545,000 Transcontinental Short Line first mortgage 4 per cent bonds. The total discount on the sale of these two issues was \$737,000, which was debited to profit and loss.



The Atchison, Topeka & Santa Fe

port, is due to a continually growing appreciation of the wonderful southern California country. The Santa Fe can well afford to make low rates from the east if such rates will make it possible for a very much larger number of people to become acquainted with southern California than would be possible under the first-class one way regular rate. The growth of the population of southern California means the growth of earning power of the Santa Fe.

Many people think that the Atchison, Topeka & Santa Fe offers an opportunity for the soundest investment of any railroad property west of the Mississippi. President Ripley is sometimes spoken of as being a pessimist on the railroad situation as a whole, but an optimist on the Atchison. It is below net income in the income account that the strength of the company is most striking. In 1916 net operating income amounted to \$43,780,000, and with only \$3,307,000 "other income" there was \$32,580,000 available for dividends after paying interest and rental charges. In other words, the fixed charges of the Santa Fe are in proportion to its mileage and gross earnings extraordinarily small. This is the result of skillful financing with bond issues bearing low rates of interest (4½ per cent); the farsighted and

The smallness of this amount is apparent when it is remembered that it was 5 per cent stock and 4 per cent bonds that the company was selling in a money market in which the combined credit of England and France was back of government 5 per cent bonds being sold at a very considerable discount. At the end of 1916 the Atchison, Topeka & Santa Fe, with no loans and bills payable, had cash on hand of \$43,699,000.

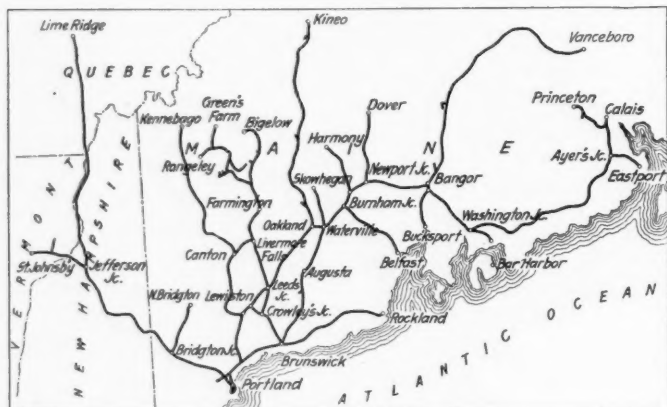
The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated.....	11,247	11,114
Freight revenue	\$91,432,429	\$80,504,393
Passenger revenue	31,568,601	27,823,064
Total operating revenues	133,762,392	117,665,587
Maintenance of way and structures	19,518,635	16,514,468
Maintenance of equipment.....	20,514,960	19,764,535
Traffic expenses	2,755,736	2,649,175
Transportation expenses	38,281,054	34,827,705
General expenses	2,904,040	2,476,595
Total operating expenses	83,730,960	76,091,554
Taxes	6,210,366	5,497,317
Operating income	43,779,993	36,051,401
Gross income	47,087,123	39,048,551
Net income	32,579,735	24,130,862
Dividends	18,690,965	17,550,017
Appropriations for investment in physical property	7,000,000	6,513,397
Surplus	6,819,091	.....

MAINE CENTRAL

THE Maine Central is the only comparatively large New England road that is in a satisfactory financial condition. In the fiscal year ended June 30, 1916, it paid its regular annual dividends of 6 per cent on the common stock, the first two quarterly dividends of $1\frac{1}{4}$ per cent on its \$3,000,000 new preferred stock, and 1 per cent additional on common stock exchanged for first and refunding mortgage $4\frac{1}{2}$ per cent series A bonds, and appropriated nearly \$200,000 for investment from income in property and had a surplus of \$248,000. At the end of the year there was \$2,514,000 cash on hand and \$2,492,000 demand loans and deposits. Against this latter there was a liability of \$2,492,000 for Maine Railways Company's 5 per cent notes assumed by the Maine Central.

It will be recalled that in accordance with an agreement entered into in April, 1914, the Maine Central Railroad, through the formation of the Maine Railways Company, bought approximately \$16,000,000 of Maine Central stock from the Boston & Maine at \$95.25 per \$100 share. The details of the transactions connected with the sale by the Boston & Maine of a majority of the stock of the Maine Central are complicated, but the substance of the transaction was this: The holder of the majority stock of the Maine Central, namely, the Boston & Maine, agreed to sell back to the Maine Central its own stock and thus to turn over to the minority stockholders all of the stock. The authorized



The Maine Central

total capital stock of the Maine Central is \$25,000,000. During the fiscal year ended June 30, 1916, the outstanding common stock was reduced from \$24,888,000 to \$14,888,000 by the conversion of \$7,000,000 of common stock into first and refunding mortgage $4\frac{1}{2}$ per cent bonds, and \$3,000,000 common stock into \$3,000,000 preferred stock. The plan is to distribute the stock which was bought from the Boston & Maine to individual investors. In this way the Maine Central has been converted from a company controlled by the Boston & Maine, which was in turn controlled by the New York, New Haven & Hartford, into an independent company. As of June 30, 1916, there were 1,459 common stockholders, with average holdings of 82 shares. Of the total number of common stockholders 957 were residents of Maine and 275 of Massachusetts. There were only 100 stockholders outside of New England.

The Boston & Maine operates 1,221 miles of road, of which only 76 miles is double track. Its gross earnings per mile are between nine and ten thousand dollars a year. In the fiscal year ended June 30, 1916, the total tonnage of freight carried was 7,548,000. Of this, 2,622,000 tons was lumber and other forest products, 1,228,000 tons was products of agriculture and 1,669,000 tons was manufactures. The total tonnage in 1916 was greater by 585,000 tons, or between

8 and 9 per cent than the tonnage in 1915. The three principal commodities showing increases were lumber, with an increase of 220,000 tons; pulp wood, with an increase of 201,000 tons, and paper (one of the items included in manufactures), 126,000 tons.

Total operating expenses in 1916 were \$8,193,000, an increase of only \$49,000 over the previous year. In part this result was obtained by a decrease of \$53,000 in the amount spent for maintenance of equipment and an increase of only \$88,000 in transportation expenses, notwithstanding the much larger business.

In 1916 the average revenue freight trainload was 318 tons, an increase of 28 tons over the previous year; the average length of haul was 97 miles as against 94 miles in the previous year, and the average ton-mile rate was 1.060 cents as against 1.097 cents in the previous year.

About a quarter of the total operating revenue of the Maine Central comes from passenger business, and total passenger revenue in 1916 amounted to \$3,327,000, an increase of only \$24,000 over the previous year. The average passenger journey was about the same in both years—a little over 38 miles; and the average rate per passenger per mile was 2.304 cents in 1916 and 2.278 cents in 1915.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916	1915
Average mileage operated.....	1,220	1,216
Freight revenue	\$7,741,542	\$7,179,701
Passenger revenue	3,327,166	3,302,911
Total operating revenues.....	12,068,708	11,350,423
Maintenance of way and structures..	1,644,715	1,630,530
Maintenance of equipment.....	1,691,646	1,745,053
Traffic expenses	137,860	135,733
Transportation expenses	4,272,541	4,184,314
General expenses	247,911	332,890
Total operating expenses	8,192,578	8,143,965
Taxes	636,423	644,785
Operating income	3,171,505	2,561,482
Gross income	3,792,837	3,386,060
Net income	1,600,476	1,618,080
Sinking fund	42,867	40,051
Dividends	1,111,123	1,483,002
Income appropriated for investment....	189,628	74,643
Surplus	247,858	20,384

NEW BOOKS

Poor's Manual of Industrials for 1916. Published by Poor's Manual Company, 80 Lafayette street, New York. Price \$5.

This is the seventh annual number of the Manual of Industrials and, like Poor's Manual of Railroads, it is the best thing of its kind published. The public interest in industrial stock which has developed in the last year and a half makes this issue of the Manual of Industrials invaluable to a larger number than ever before. The book contains the latest income account and balance sheet of manufacturing, mining and miscellaneous companies and in most cases the figures are presented in comparative form. The general information in the book is revised to August 15 and the book also contains an appendix giving recent information on steam railroads and public utilities, the 1916 manuals for railroads and for public utilities having been published some weeks ago.

RAILWAY CONSTRUCTION IN WESTERN AUSTRALIA.—At the opening of the Lake Grace Railway (25 miles), the latest agricultural railway extension in Western Australia, the Premier stated that during the last four and one-half years the government had constructed 900 miles of railways. The expenditure on these extensions was perfectly justified and a continuance of such a policy was essential to the best interests of agriculture and the state as a whole. The new line provides long-looked for facilities for the settlers of the Wagin-Kukerin and Lake Grace districts to forward their wheat and other produce to market.

Locomotive Problems That Demand Solution*

A Few of the More Important Phases of Design and Operation Which Are Greatly in Need of Attention

By George M. Basford†

WHEN this club began (1901) the biggest locomotive in the world was, I believe, a Consolidation running here in Pittsburgh. For a long time after that locomotives ran to size and weight. It was easy to make them bigger and heavier. But a far greater and more difficult as well as more important problem faces us today. It is the problem of forcing every pound of weight to justify itself in terms of power to serve mankind. Who has a bigger, nobler opportunity and duty than this?

When our club began, officials wouldn't listen, as they do now, to consideration of improved efficiency. Superheaters, brick arches, combustion chambers and feed water heaters are old. Their real application to our great problem came but six years ago, and they are only now beginning to be really used in this problem. Today officials are reaching out for new things and old things in new application. They eagerly seek capacity increasing factors. Why? Because they are facing the question of increased weights in equipment and in operation. They need more power per unit, to do the world's business and do it economically.

Therefore young men never had the opportunity or the duty that they have facing them today. Do they realize it? To try to make some of them see it is the object of these paragraphs.

Let us make a little list of big possibilities in locomotive development to show what lies before young railroad men right now. The items are mentioned at random, not in order of importance.

Boiler Design as a Whole.—Size is only one part of this problem instead of being the chief feature as it has been considered in the past. It is now a question of balancing all factors to make and to absorb the maximum amount of heat per unit of weight. The day of ratios between grate area, heating surface and cylinder volumes has given place to a day of providing steam to produce definite amounts of cylinder horse power within defined limits of weight. This is revolutionary and the corralling of many a fractious heat unit must be made possible. This is your main line of activity in boilers.

Boiler Circulation.—Many a bright mind is engaged in improving the movement of the water in the boiler with the promise for the future. Very little positive information is available now upon this subject. Who will put us straight on the matter of boiler circulation?

Improved Grates.—Grate design is now being studied as it never has been before. Experimental developments in grates as to air openings and grate construction promise valuable improvements in the near future. Conditions requiring maximum power lead to the conclusion that air openings through the grates should be as large as the character of the coal used will permit. Thirty per cent is aimed at. Recognition is waiting for a thoroughbred grate expert. The largest Pacific type passenger locomotive has 47,500 lb. tractive effort and the same grate area that was used in the same service six years ago when the tractive effort was but 32,900 lb. This problem is a worthy one for that expert. What is he going to do about it?

Ash Pan Design.—This is a vital factor in the production of heat. To provide air sufficient for intense combustion is

the object of experiments now being conducted which promise a simple solution of this problem. To provide air enough for a big firebox and put the air where it is wanted is no child's play. The speed of gases at a certain point in a big firebox, working hard, is 200 miles per hour. Who is the expert who will point the way to the ash pan design to supply air enough and how will he provide air openings in the ash pan sufficient to maintain atmospheric pressure in the ash pan at maximum rate of power development?

Combustion Engineering Applied to Firebox Design.—The purpose is to attain, with all fuels, the highest degree of heat intensity per unit of firebox volume. Here is where the energy is developed. This is the heat factory. It is worthy of a life time study. Important developments are nearly ready to be announced. Your field is nearly 70,000 fireboxes.

To burn the gases completely before they reach the flues and to accomplish this in the big firebox is another big problem. This involves grates, arches, air admission below and directly into the fire and mixing of the burning gases by division into small streams. It also involves the shape and size of the firebox and combustion chamber. All this is now being worked out on paper and in practice. Recent studies in firebox design recognizing the great importance of heat radiation and the relatively small importance of transfer of heat by convection have revealed the firebox problem in a new light. This will result in larger fireboxes, larger grates, larger combustion chambers and in new developments in the mixing of the burning gases by improvements in brick arches. Improvements already tried experimentally promise remarkable results. With all this to do, the field for combustion experts is very far from being over crowded. Before long 100,000 fireboxes will be in service to keep this country going. A little improvement applied to each of these will save a mountain of money.

It is known that a certain sacrifice of tube heating surface for the benefit of increased firebox volume in the form of a combustion chamber is justified but how far should this be carried? This should be investigated. Then there is the question of tube length.

Front End Draft Appliances.—Here is another field of promise. To produce the pump action necessary for draft with minimum back pressure load on the cylinders will bring great credit to the one who is successful in working it out. Why should front end construction that itself consumes 33 per cent of the draft produced be perpetuated?

Detail Design.—Developments in details to enable locomotives to run between shoppings with minimum running repairs present interesting possibilities. Shoes and wedges, journal boxes, hub liners, long driving boxes, improved throttles, lubrication, engine truck, trailing truck, tender truck design, also improved couplings of locomotives to tenders and radial motion for front and rear driving axles of long wheel base locomotives all have a bearing on this question.

Tender Design.—Tenders may be said to have been somewhat overlooked in the speed of going to heavier and more powerful locomotives.

Labor Saving Devices.—Here is a definite line for development which is well started in power reverse gear, power operated firedoors and grate shakers and coal pushers, also the greatest of all these devices, the mechanical stoker. All

*From a paper on Railway Clubs and Young Men, presented at a meeting of the Railway Club of Pittsburgh, Friday evening, September 22, 1916.

†President, Locomotive Feed Water Heater Company, New York.

these factors are needed because of the increased size of the locomotive. This renders it necessary to provide power auxiliaries to take the place of physical strength and endurance. Then locomotive operation becomes a matter of brain work rather than brute force.

Improved Valve Motion.—Great strides in this direction in ten years give encouragement to the hope that there is more improvement to come. How crude the valve gear of the past would look on a big modern locomotive from the standpoint of convenience, let alone the question of economy in performance and the possibility of standardizing construction! Imagine yourself crawling under the wheels of a big modern locomotive to get at the eccentrics on the main axle!

Superheating.—This improvement is by no means finished. Those who are living with this problem are in position to lead still further in their influence on cylinder performance and in the effective use of the heat from the firebox. Superheating engineers are ready to give higher superheat when railroads are prepared to use it by improvements in operation and maintenance. Great economies are available in higher superheat through increase in volume of the steam. These engineers are also ready to put to good use any increase of firebox temperature the combustion engineers can give them. Superheating, the greatest improvement the locomotive has ever seen, is not finished. It offers still greater possibilities when you are ready for them.

Feed Water Heating.—This is now a factor in locomotive engineering and operation. It promises to take a place next to superheating in improving economy and increasing capacity with the incidental advantage of prolonging boiler and firebox life and reducing cost of boiler maintenance. Successful feed water heating means increased boiler power. It will permit of modernizing existing boilers of outclassed locomotives to render them available again in many cases for service which has outgrown them. Feed water heaters may be applied to existing locomotives under a charge to capital account and for a number of years will defer charges to operating account for replacing those locomotives by new ones. Feed water heaters will increase evaporation per pound of coal and provide economy not available in any other way because the improvement is made from otherwise wasted heat. Locomotive boilers should be relieved of the duty of heating water. It should come to them hot, leaving only the evaporation to be effected in the boiler. Feed water heating is not new but successful locomotive feed water heating in this country has but just now been accomplished. A little later there will be more to be said on this subject. This development has been waiting for the successful heater.

Compounding.—This principle is coming to its own. No locomotive improvement fills its natural field so well as when it is properly fitted into the general scheme of locomotive design as the compound feature is fitted into the Mallet.

Water Purification.—This becomes more important every day. Before long people whose lives have been made miserable by water unfit to use in boilers of any kind will wonder why they ever used it in the most rigorous boiler service in the world. They will wonder why they ever paid the boiler repair bills of the past when the remedy is so easy and the returns so great. Let some of the young men tackle the problem of improving means and methods of water purification.

Brake Shoes.—Do you remember any illuminating paper on the subject of brake shoes within a year or two before any of the clubs? Here is an inspiring, live, subject—this and the clasp brake. It would be specially appropriate for this club to record brake and braking progress as a whole in a fitting manner and tell the railroad world what it is missing and what it ought to do.

Air Brakes.—So great have been the improvements in means of stopping trains that the authorities of a few years

ago have now new subjects to study if they would keep abreast of progress. The electric control and the automatic adjustment of braking power to load in addition to other improvements are distinctly revolutionary in their effect on the capacity of railroads as well as on the safety of travel. The capacity of some very important railroads is specifically a question of brakes. Do the railroads know what they ought to do next in air brakes?

Powdered Fuel.—Herein lies a possibility of the use of heretofore impossible fuels with a \$250,000,000 annual steam locomotive fuel bill to work on, also the possibility of increased steam making capacity and perfection of firebox operation that until recently were not hoped for. Increased hauling capacity and continuity of locomotive operation and eliminating of ash pit delay offer great promise for the future. Increased boiler capacity is a question of producing maximum calorific intensity per cubic foot of firebox volume. This is the raw material for the heating surface and superheater to work with. Speaking in general terms pulverized fuel will transform an 80 per cent boiler into a 100 per cent boiler. Consider what this would mean to say 30,000 locomotives in this country that are deficient in boiler capacity. Here again a capital charge will put from five to ten years of new life coupled with increased capacity into a lot of old power. It will put many an outclassed locomotive back on the main line. The chief reason for buying new locomotives is to get boilers that are big enough to haul maximum tonnage over ruling grades. Increased boiler capacity resulting from fuel efficiency is the question answered by pulverized fuel. It has already shown a boiler efficiency of 77 per cent with pulverized Kentucky unwashed screenings, as compared with 61.1 per cent with lump coal from the same mine hand fired in the same locomotive.

Alloy Steels.—If you could see confidential figures now in the desk of your speaker some of you would jump to the task of improving locomotive design with respect to lightening reciprocating and revolving parts of locomotives. This means making every pound of weight work for you. It includes possibilities in locomotives and tender designs as well as parts of running gear. It is difficult to understand how the possibilities of improved use of a pound of weight rendered possible by improved detail design of running gear could have been overlooked so long. Your speaker has recently given three years to this study and is in position to state that there is an insistent need of brain work followed by action in this field. There is not a minute to lose in taking up the light part and counterbalance questions and the reduction of dynamic augment by improved designs and alloy heat treated steels.

Signaling.—This has become a matter of speed control and increased capacity of track as well as a safety provision. Wonderful strides are being made in this field that are not widely known or well understood. Signaling is seldom mentioned before the various railroad clubs. It will have an important effect upon the operation of locomotives in the near future.

Do you want more things to do? Then get into locomotive operation. Work out plans for keeping expensive locomotives in service a larger portion of the day. An average figure representing present practice is 4 hr. 19 min. actual service out of a 24-hour day. Get into questions of organization, selecting, training and promotion of men. Who will wake up the railroads to the suicidal policy of neglect of the selection of recruits and of training these recruits in all departments? Take up the question of railroading as a business with real cooperation of all departments. Study suitability of locomotives to their working conditions. Who will show railroad managers how much money may be made in suitable roundhouses and in shops and shop equipment for maintaining big engines? No specific mention of the details of the car problems can be made on this occasion but

the car offers opportunities that are little less important than those of the locomotive.

Best locomotive records, reflecting up to date developments show a water rate of 14.6 lb. per indicated horse power hour. What may be termed unimproved locomotives produce this unit on about 24 to 30 lb. Between these figures lie great possibilities. Between them lies your opportunity. The majority of locomotives are in or near the 24 lb. class

REAL LIFE IN THE DESPATCHER'S OFFICE

By J. L. Coss

Our telegraph operators are gradually receiving more concessions from the railroads in the way of additional pay and shorter hours; and the less work the more negligence. On some lines eight hours is now a day's work in relay offices, nine hours at terminals and two-man offices and eleven hours at one-man stations, with three hours at one-man stations on Sunday.

In fact, the business on Sunday is pretty nearly tied up, so far as the telegraph end of it is concerned. But the trains must be run on Sunday the same as on other days, and their movement, as a matter of fact, is handicapped by the scarcity of operators. The despatcher is compelled to scheme and figure far ahead to handle his Sunday work. If he gets caught in a tight place and is forced to call an operator for five or ten minutes' work, he is obliged the next day to O. K. an overtime slip for an hour, and then explain why it was necessary to do it. Very likely this same operator had been absent from his office a half day in the week before on a fishing trip; and this through the kindness of the despatcher. He was not docked on that account.

But the operators do not seem as anxious to render first class service as they were 20 years ago. At that time they worked 12 hours a day, did more work than they do today and did it better; and the despatcher did not have to call an operator then as much as now though he now has a bell to do the calling. It is seldom now that a despatcher can line up five or six offices within a reasonable length of time, and likely three out of five will delay the move by having to adjust his blanks or instruments, or something. Again, they do not seem to take the interest in keeping the despatcher advised as to the conditions existing at and near their offices. They do not OS trains promptly. After they clear a train they do not think it necessary to advise the despatcher if the train does not move promptly. Many other things, too numerous to mention, show that they are unwilling or lack the intelligence to advance the interest of the corporation from which they draw their money. This is not intended to apply to each individual operator, because there are some good ones; but there are many who are guilty of these faults.

Not so long ago, an agent-operator at a very small station called up one morning about 8:30 and asked if he could be absent that day, saying that his wife would be on hand to sell tickets if we could do without the telegraph service. He was told that we could get along without him. The next morning the request was repeated and he was given permission to be absent that day, the despatcher telling him that, though the accommodation was cheerfully granted, it was objectionable to close the office so often. About a week later, one Sunday, about fifteen minutes before this man's time was up, an engine ran short of water and the despatcher was forced to hold the operator on duty about 40 minutes to deliver an order. The next morning an overtime slip was sent in. He has been off several times since for a half day at a time. It is safe to say that if he should call up today and want to be off a few hours and were refused, he would think that he was being misused.

A westbound red ball freight train had been seriously delayed on an adjoining division and we were asked to hurry

it along as much as possible in order to recover some of the lost time. The train proceeded nicely up to the last 20 miles—the last telegraph office before reaching the terminal. At this station there was a water tank where most of the trains took water and where there were nearly always orders out. At this time the red ball was only a short distance ahead of a passenger train and there were two eastbound freight trains to be run in this territory against the red ball and the passenger train. When the red ball started the operator was told to ask the conductor if everything was running smoothly and if he would go in ahead of the passenger train. The conductor said everything O. K. and he should go in ahead. I cautioned the operator not to OS him until he had gone, because I had to put a call on the connection west and wanted to be reasonably sure about the train before calling the west connection. In about ten minutes after this conversation with the operator he reported the train out and the call was placed. In thirty minutes from the time the operator had reported the train out he reported that it had not gone, but was in the west end of the yard, on the siding. Asked what he had been doing he replied that he had been selling tickets for a passenger train. On an investigation as to how busy he had been it appeared that he sold five card tickets, which would consume about three minutes; and all the time the caboose of the train was but a quarter mile away and could have been plainly seen at any time from the office window. This delay knocked out the freight and resulted in an hour's terminal overtime for the crew west and caused the two eastbound freight trains to make two hours' road overtime each because of the delay to the red ball freight, which had been delayed by track repairs.

A peculiar circumstance happened sometime ago at a terminal where three operators are worked, a continuous office. Sometime after midnight the third trick operator's wife took sick and he went out to see her, first advising the despatcher. When he reached the house he found her in such condition that he could not leave; but he called the second trick operator and told him to go to the office and advise the despatcher the conditions. The latter did so, and the despatcher told him to go home, as he could not work without violating the law; told him to leave the key to the office with the yardmaster so that the conductor of an extra, which had been called, could get his orders. The despatcher thought that by this course he was doing the third trick operator a favor. However, the O. R. T. committee has taken the matter up because their contract was violated by allowing a conductor to take the order at a station where there is an operator. What do you think of such a committee?

A message was received lately at the despatcher's office from a section foreman, advising that a frog and a switch were being exchanged in the yard at a certain place. The telegraph office was situated west of where this was being done and the freight house east. There were a couple of freight trains approaching this point when the word was received and the operator at the telegraph office was instructed to telephone the freight house to advise these two freights to look out for the change of frogs. The O. R. T. chairman in some way got hold of this case, and made a grievance out of it, on the ground that the freight house man should not have been used to handle messages, as he was not an operator. This chairman would rather these trains should be derailed, with possible bodily injuries, rather than that word be sent to them in an irregular way.

IMPORTS OF IRON ORE.—The imports of iron ore into the United States for the year ended June, 1916, were 1,059,756 tons, as compared with 1,341,281 tons in 1914-15. Of the iron ore received from abroad in the 10 months ended April, 1916, 63,610 tons came from Spain, 181,531 tons from Sweden, 84,343 tons from Cuba and 128,073 tons from other sources.

A Large Reinforced Concrete Coaling Plant

New Station for the Duluth, Missabe & Northern at Proctor, Minn., Is Equipped with Modern Machinery

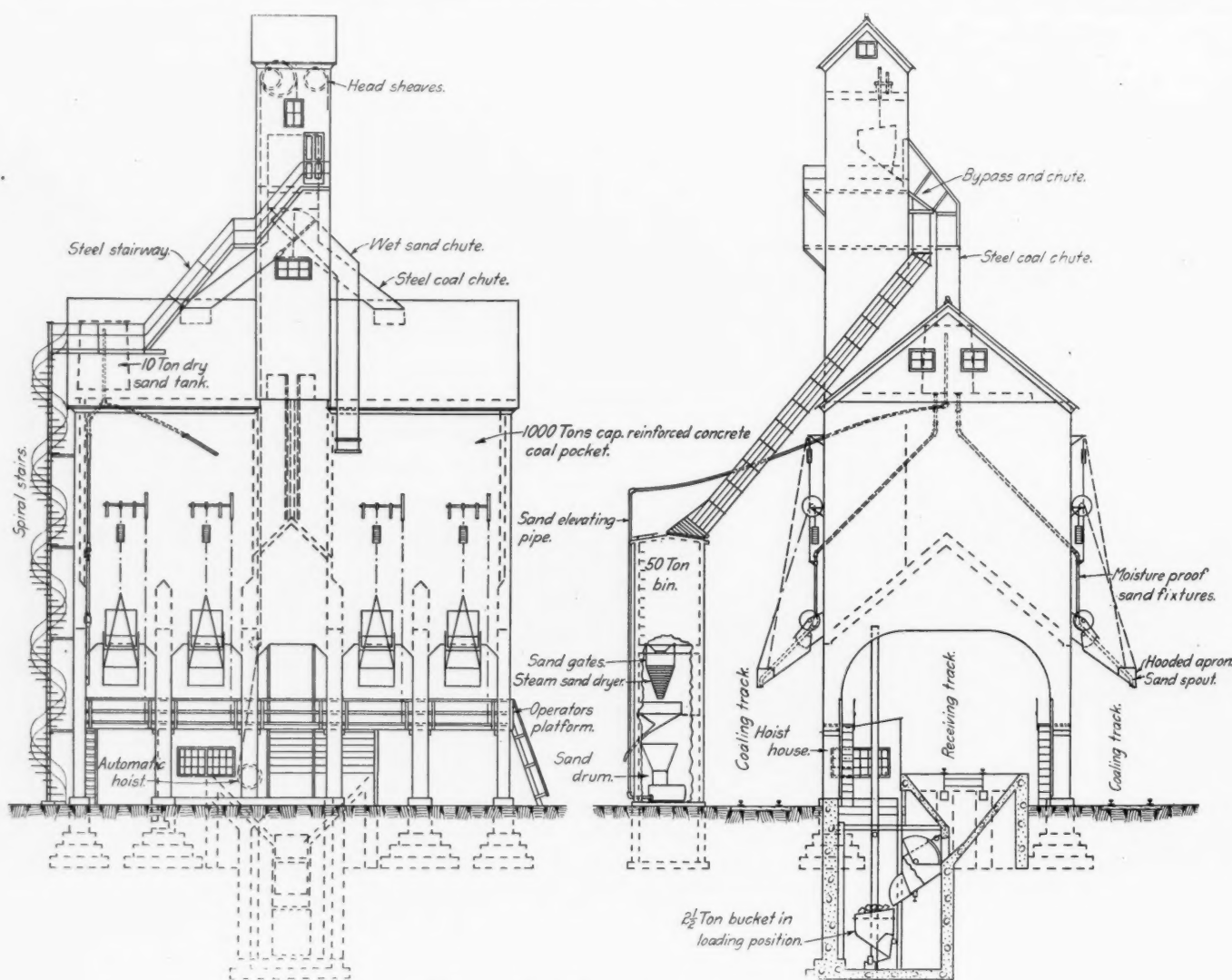
A REINFORCED concrete coaling station having a storage capacity of 1,000 tons of coal has been built for the Duluth, Missabe & Northern at Proctor, Minn., and aside from the interesting details embodied in the design and construction of a station of this size in reinforced concrete, the project merits notice as an example of recent development in equipment for handling coal and sand.

The coaling plant consists of a coal bin structure 56 ft. long, 32 ft. wide and 51 ft. 6 in. high, surmounted by a roof

bin in the top of the coaling station by means of compressed air.

STRUCTURAL DETAILS

The design of the superstructure of the station structure is simple. The bins are supported on two rows of concrete columns along the two sides of the building, there being six 2-ft. by 2-ft. 6-in. columns in each row. Transverse girders of the same width as the columns span between opposite

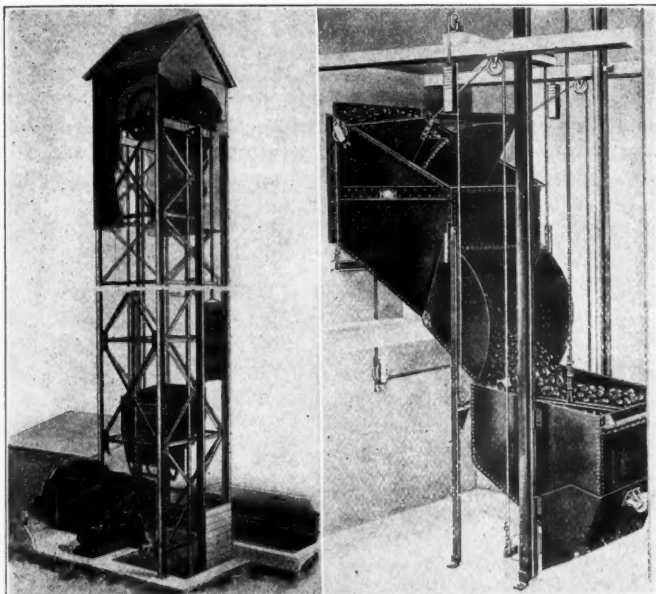


Side and End Elevations of the Plant.

and a headhouse of structural steel covered with corrugated iron, which includes a bucket tower extending 48 ft. 6 in. above the top of the bin, or a total of 100 ft. above the track level. The station serves two tracks, one on either side, and receives coal from a track between the two coaling tracks which passes through or under the station. The sand facilities occupy a separate reinforced concrete structure 12 ft. by 9 ft. and 33 ft. high located just outside of one of the coaling tracks and opposite the center of the station. The wet sand is elevated by the coal conveying machinery to the top of the tower where a spout is provided to chute the sand into the building, in which it is dried and returned to a

sides of the building over each pair of columns and support the floor of the bin, which is 14 in. thick and slopes downward each way from the longitudinal center line of the structure. This slope has a pitch of 40 deg. from the horizontal so that the transverse girders have a maximum depth of 12 ft. 4 in. at mid-span. Fillets on a curve of 8-ft. radius join the girders to the columns and brace the structure against wind action, at the same time giving a pleasing appearance. The sides of the bins are 7 in. thick and span horizontally between pilasters which are 18 in. wide and project 11 in. into the bin. These pilasters are located directly over each column along the two sides of the building

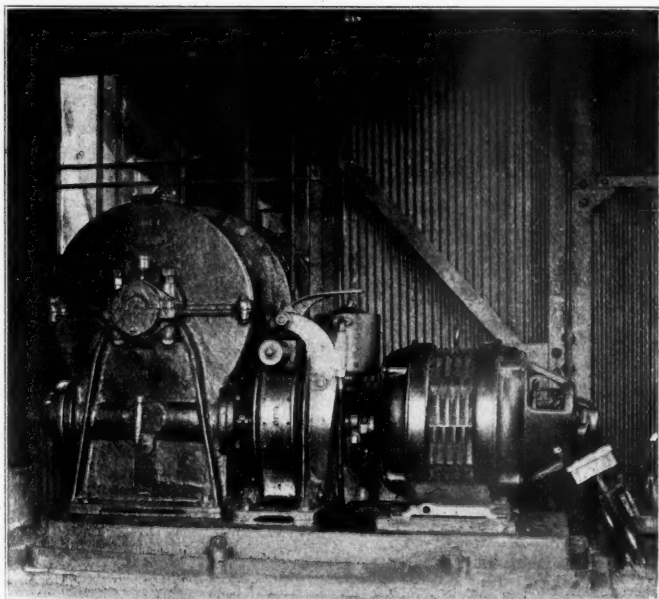
and at a spacing of about 10 ft. center to center at the two ends. They distribute the lateral pressure of the coal to the top and bottom of the bin, being absorbed at the bottom by the floor system and at the top by a horizontal girder, continuous on all four sides which is braced at each corner



Arrangement of Cables for Hoisting and the Bucket in Position Under the Measuring Feeder

by a diagonal tie or horizontal knee-brace which connects the nearest pilasters in adjoining walls.

The bin is divided on the transverse center line into two compartments by an interior wall which is of similar construction to the outside walls. Besides this subdivision a shaft, 9 ft. by 9 ft. 8 in., is cut out of the bin in the middle



The Traction Hoist in the Hoist House

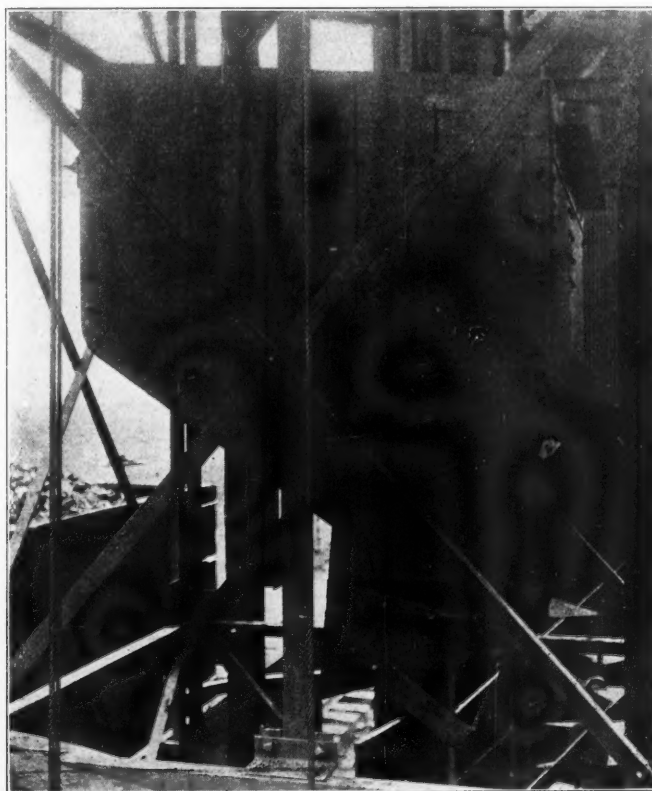
of one side to provide for the passage of the elevator bucket through the bin structure. Four openings are provided on each side of the bin at the bottom for the discharge of coal. The bin bottom between these openings is filleted with cinder concrete to insure a flow of coal to all of the outlets so that the bin can be completely emptied whenever necessary.

The space between the supporting columns and under the girders is ample to admit the coal cars on the receiving

track which is elevated four feet above the coaling track level. The track hopper is 20 ft. long and 15 ft. wide, leaving ample room on one side for the elevator tower and hoist house and space for an operating platform on the opposite side. The receiving track is supported on the track hopper by 24-in. 80-lb. I-beams. The track hopper and the bucket pit which extends 21 ft. below the track level are built of monolithic concrete, special care being taken to insure water tight construction. The foundation material encountered at a depth of 8 ft. below the ground level was found to be excellent and no difficulties were encountered in the foundation work. The sides of the track hopper except over the bucket pit are of plain concrete bedded on the excavation or on thoroughly compacted filling.

COAL HANDLING MACHINERY

The coal delivered to the track hopper in bottom dump cars is fed by a Schraeder measuring feeder into the elevator



The Elevating Bucket in the Shaft

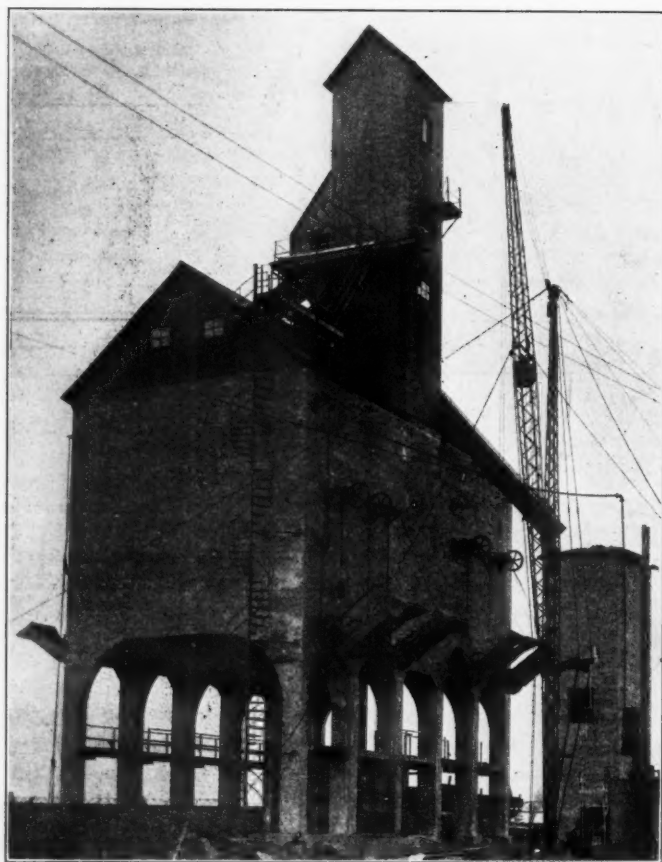
bucket. This feeder which has a capacity of $2\frac{1}{2}$ tons, is actuated by the ascent and descent of the elevating bucket, being arranged in such a manner that $2\frac{1}{2}$ tons of coal are discharged into the bucket each time that the latter passes by the feeder in its descent.

The elevating bucket which has the same capacity as the feeder, ascends and descends in the elevator shaft, in which it is secured by 30-lb. rail guides anchored to the structural members of the shaft. As shown in one of the accompanying photographs the coal is retained in the bucket by means of an apron at the bottom which is equipped with a 6-in. roller that travels on a continuous steel guide from the bottom of the pit to the bucket discharge point. This insures the retention of the coal except when the roller guide permits the apron to open up at the top of the tower to discharge the coal into the bin.

The bucket is carried by two cables to which it is connected by means of an equalizer. In case one cable becomes worn and breaks, the bucket cannot drop because of the second cable. As shown in the accompanying drawing the bucket is balanced by a counterweight. The two cables

attached to the bucket pass over 48-in. turning sheaves at the top of the tower, down around the grooves of the drum on the traction hoist, up over the turning sheave and then down to the counterweight to which they are secured. The arrangement is such that the bucket cannot be hoisted above the discharge point even though the automatic feature of the operating machinery should fail, because should an over-wind occur, either the bucket or the counterweight will come in contact with the bottom of the pit and thus throw slack into the cables, causing them to slip on the traction hoist drum.

One of the photographs shows the traction hoist installed in the hoist house. The hoist is operated by a 20-hp. electric motor connected through a set of cut bronze and steel gears in a cast iron housing and operating in an oil bath. The operating machinery is controlled by a Cutler-Hammer automatic controller, which stops the motor when the bucket reaches either end of the shaft and then starts it in the opposite direction after the passage of a sufficient interval of time to permit the complete filling or emptying of the bucket. Substantial hatch limit switches are installed at the top and bottom of the shaft, bringing the bucket to a standstill, at which time a solenoid brake on the hoist sets



The Completed Plant

fast, holding the load until the current is applied, reversing the operation.

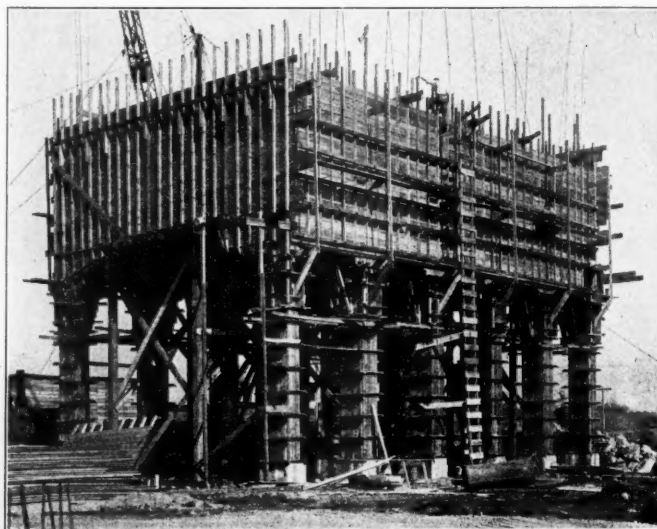
The operation of the bucket when handling sand is exactly the same. The sides of the track hopper were given a slope of 50 deg. to insure the ready flow of the wet sand and the necessary deflectors are provided in the chute at the top of the shaft to deflect the sand into the sand chute, as well as to control the flow of coal into either one of the bins.

The outlets from the coal bins are equipped with manually operated under-cut gates provided with hooded aprons to deflect the coal directly into the tenders. The station is

equipped with a coaling platform along each side just under the coaling gates so that the fireman or station operator does not need to stand on the tender when taking coal. The coal gates are arranged for positive operation in opening and closing, so that there is no danger of burying an engine with a bin full of coal.

THE SAND DRYING PLANT

The sand building contains a Rands gravity sand plant. The top of this structure contains a bin having a capacity of 50 tons of wet sand. The space below this bin contains the apparatus for drying and screening the sand and for returning it to the storage bin in the top of the coaling sta-



Formwork for Columns and Bin

tion. At the bottom of the storage bin a gate is provided to control the flow of the green sand into a Beamer steam sand drier. This is so designed that the steam pipes themselves act as retaining walls for the green sand, permitting the moisture to escape immediately into the atmosphere. The spaces between the coils are such that they readily hold the green sand, but permit dry sand to slip through and fall onto a gravity sand screen which removes all foreign matter and particles of sand which are of too large a size. From the screen the sand passes into a hopper of an automatic air drum, from which it is blown by compressed air into the dry sand storage pocket referred to previously. A 2½-in. pipe is used for this purpose equipped with special Pittsburgh chilled iron long-radius elbows. The air is used at a pressure of 110 lb. per sq. in., being supplied from the compressed air plant of the railway's engine terminal.

This coaling and sand plant was designed and erected under the direction of H. L. Dresser, chief engineer of the Duluth, Missabe & Northern, by Roberts & Schaefer Company, Chicago, who furnished and installed all of the operating machinery.

BLIGHT-KILLED CHESTNUT USEFUL

The Department of Agriculture has issued a circular to the effect that experiments conducted by the Forest Service of the Department, to determine the value of chestnut wood that has been blight-killed, show that it is just as durable as healthy timber. Posts, poles and ties made from infected timber show that, after three years' use, they are as sound as timber not infected. Blight-killed timber, which had seasoned on the stump for several years and which had lost its bark, resists decay better than healthy wood from which the bark was not removed.

RAILWAY REAL ESTATE ASSOCIATION

The second annual meeting of the Railway Real Estate Association will be held at the Hotel Sherman, Chicago, on October 11, 12 and 13. The program for the meeting is divided into three parts and will include the reading and discussion of papers on the first day on subjects pertaining to real estate and right of way work, on the second day on subjects pertaining to taxes and on the third day on development and valuation work. The association's committee on revision of the constitution will report favorably upon an amendment to provide for two divisions of the association, to be devoted particularly to tax and valuation work, one day of each meeting to be devoted to special sessions of these divisions. Later it is hoped to establish other special divisions, such as industrial, agricultural and insurance.

Among the speakers scheduled for Wednesday are Peter McPherson, Canadian Pacific, and W. L. Lawrence, Delaware & Hudson. For Thursday, F. A. Waters, Los Angeles & Salt Lake; A. J. Rooney, Chesapeake & Ohio; S. G. Cramp, Pennsylvania Lines; W. K. McElroy, Pennsylvania Railroad, and E. H. Earp, Seaboard Air Line. For Friday, M. V. Richards, Southern Railway; H. A. Howarth, Long Island, and James P. Nelson, Chesapeake & Ohio.

PREVENTION OF RAILROAD STRIKES

The Committee on Public Utilities and Law of the Merchants' Association of New York has prepared a report on the Prevention of Railroad Strikes, which has received the unanimous approval of the board of directors of that association. An important part of the report is a plan proposed by Henry R. Towne, a former president of the association, based upon the principle of a contractual relationship, which it is believed will guarantee the uninterrupted operation of public utilities.

The resolution which the Merchants' Association asks the Chamber of Commerce of the United States to submit to referendum vote contains the following paragraph:

"Resolved, That the tenure of service of employees of public service corporations, particularly of transportation corporations, should be regulated by law in such manner that each person who voluntarily elects to enter such employment shall, as a condition of such employment, be legally obligated by contract to continue therein for a specified term, during which term he may not lawfully quit that employment nor the corporation lawfully discharge him from its service, except as provided by such contract; and that such contract should provide adequate penalties for violation of its terms by either party."

MR. TOWNE'S PLAN

In presenting his plan Mr. Towne said in part:

"The events of August, 1916, have focussed public attention upon a national problem which imperatively calls for solution. They have shown the existence of a self-constituted power exercised as though co-ordinate with that of the Federal government, an *imperium in imperio*, which the President has felt constrained to negotiate with, which has notified him of its terms, and whose terms he has deemed it expedient to accept and to urge upon Congress, as a basis for hasty legislation, in order thus to save the people from threatened calamity deliberately plotted. Until Congress acted the threat remained effective and the country in painful suspense. The situation is intolerable, and the public demands that a remedy be found.

"That such a situation could develop is due chiefly to two causes, namely, (1) the vast growth in number, size and importance to the community of public utility corporations, and (2) the coincident and almost equal growth in numbers, power, and influence, both for good and for evil, of organized labor.

"But when we consider a case involving both groups, that

is, a public utility corporation and some or all of its employees, we find that there are three parties directly concerned, the third party, and the one having the chief interest, being the public, the people, by whom the franchise was granted under which the corporation exists and acts, and by virtue of which the employees have been enabled to find employment in its service. To this third party, the people, it is a matter of vital concern that the service, to obtain which the franchise was granted, shall not be interrupted, least of all by either one or the other of the parties who are the beneficiaries of the franchise, one of whom thus finds employment for its capital and the other for its labor. Just as the former, the public utility corporation, is required under its franchise to perform the stipulated service for the public convenience, so also should the latter, the body of its employees, be required, as a condition of entering its employ, to abstain from any act, of commission or omission, tending to interrupt the service or designed to have that effect. The act of entering the employ of a public utility corporation is voluntary. Each individual who enters it does so of his own free will. He knows, or should know, that the corporation operates a public utility, for the benefit and convenience of the people, and it should be required of him, by law, that, as a condition of employment under such a corporation, he shall agree in advance not to do anything knowingly, alone or in combination with others, designed or tending to interrupt the service to the people for which the corporation was chartered by them. In so doing he would surrender no right to liberty of action except the right to inflict injury on the public in the pursuit of selfish ends, and this right is one which the people may justly require to be surrendered by those who voluntarily seek employment in a service created by act of the people for the benefit of all the people, including organized labor itself.

"For the members of any group to claim or seek the right to inflict vital injury upon all the rest of the community would in effect be tantamount to a declaration that such members were not loyal citizens of the state but public enemies.

The essential features of the contractual relationship plan proposed by Mr. Towne are as follows:

1. An enlistment or enrollment contract for a stated term. After a probationary period, in the case of a new employee; removable by mutual agreement, at the end of term, in the case of an old employee.
2. A "service record" of each employee, to be kept.
3. Preference in promotions, and in retention in the service, to be based on such records.
4. Penalties for violation of the contract by either party, to consist of cash fines.
5. Fines against company to be collectible from a fund created by the company and vested in a trustee.
6. Fines against an employee to be collectible from a fund created by the company's retaining, say 20 per cent of his wages until the fund equals two weeks' wages (would require 10 weeks). The company to pay interest at 5 per cent on this fund, and to repay it when the employee leaves the service as prescribed in the contract, or dies. The fund to be in the custody of a trustee.
7. Schedule of fines to be fixed by law and stated in the contract.
8. Assessment of fines to be determinable. (a) By mutual consent, duly recorded. (b) By joint Board of Award, duly appointed. (c) By Public Service Commission on appeal. (d) By legal process.
9. The company to have the right to terminate the contract. (a) Because of misconduct by the employee. "Misconduct" to be defined by law and in the contract, and also the fines attaching thereto. (b) Because of slack business or excess of help. In this case the employee to receive either 30 days' notice, or two weeks' pay and immediate release.

(c) Because of disability or superannuation of employee, on stated notice, subject to such pension provisions, if any, as may exist.

10. The employee to have the right to terminate the contract, (a) Because of valid family or personal necessity. In which case, honorable discharge, without penalty. (b) Because of sickness or of unfavorable effect on health. (c) For cause not stated, upon fair notice, say 30 days, without penalty if with the company's consent; otherwise subject to fine, as provided by law and stated in the contract.

11. Violation of the contract by the company, if duly established, to subject it to stated fines, payable to the employee, from the fund vested in a trustee.

12. Violation by the employee, if duly established, to subject him to fines collectible by the company from the fund held for that purpose by a trustee; and also, under specified conditions, to forfeiture of wages earned but not yet paid.

13. The company to recognize the right of the employee to membership in any lawful organization, and not to discriminate against him on such account.

14. The employee to respect the right of the public to uninterrupted service, and not to combine with others to cause its interruption.

15. The employee to have the right, alone or in combination with others, to request concessions, in wages, hours of work, or conditions of service, from the company, and the company to give prompt and fair consideration to all such requests when properly presented, and not to discriminate against any employee because of participation therein.

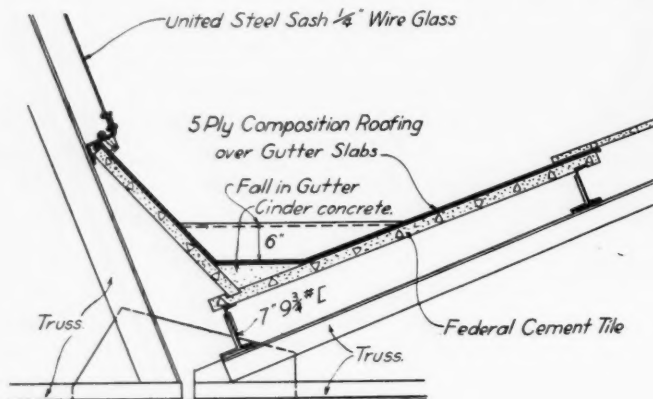
16. The employee to have the right of appeal, from acts or decisions of the company, to a "Joint Board of Award," constituted under the law by joint action of the company and its employees, as a Board of Arbitration.

17. Both the company and its employees to have the right of appeal from the rulings of the "Joint Board" to an appropriate federal or state commission, whose decisions shall be conclusive and binding, unless and until reversed by a court decision.

18. During the term of any contract between the company and an employee the discharge of the employee by the company (except as provided in No. 9 above), or the cessation of service by the employee (except as provided in No. 10 above), to be constituted an offence at law, and to be punishable as the law may prescribe.

AN INTERESTING CAR REPAIR SHED AT MEMPHIS, TENN.

The Illinois Central has recently completed a car repair shed at Memphis, Tenn., of sufficient size to house all car repair work done at that point other than light repairs

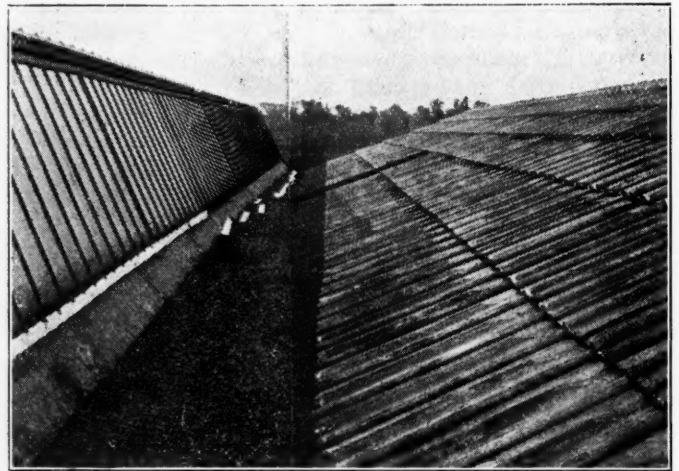


Details of Gutter Construction

requiring one day or less to the car. This structure covers more than $4\frac{1}{2}$ acres and is composed entirely of non-combustible materials. It was built over the existing car

repair yard with practically no interference with the work on the cars.

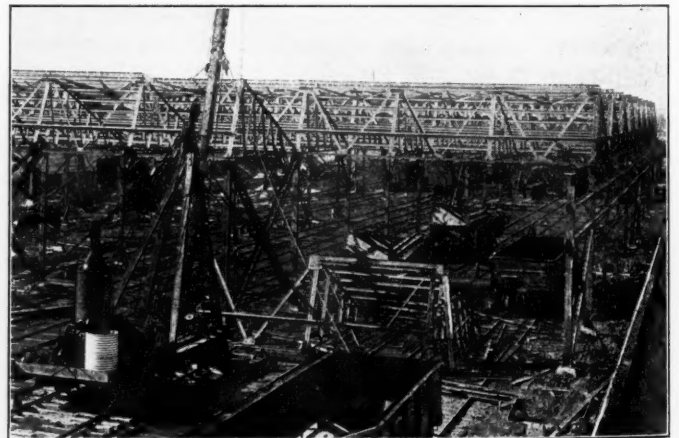
The car repair yard is located adjacent to the mechanical terminal and shops in the Nonconnah yard of the Illinois Central located about four miles south of Memphis. The building is 1,140 ft. long by 176 ft. wide and covers all of the old car repair yard, comprising five repair tracks and three additional tracks or a total of eight tracks placed 22 ft. center to center. The track space under the shed has a capacity of 152 cars, based on 19 cars per track, with 60 ft. for each car. The building consists of a series of columns supporting a saw-tooth roof, the teeth running transverse



The Saw-Tooth Roof

to the structure in rows 30 ft. apart. The sides of the building are open to a height of 14 ft. and the ends to a height of 22 ft. except where knee-braces are provided at the columns, these braces conforming to the standard clearance diagram of the Illinois Central.

The frame of the building is structural steel, with a transverse row of columns every 30 ft. longitudinally and directly under the gutters of the saw-tooth roof. There are five columns in each row placed 44 ft. center to center, the tracks being arranged in pairs between each pair of columns. The roof framing consists of triangular shaped trusses con-

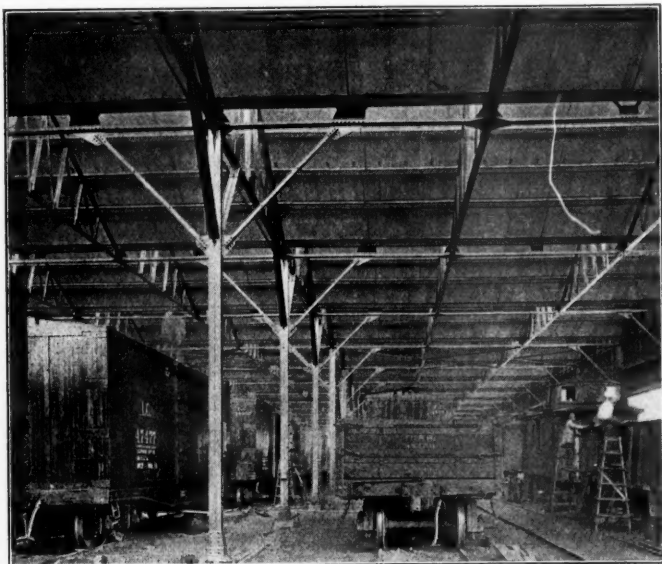


Erecting the Steel Frame

forming to the outline of the saw-teeth, spanning longitudinally between the columns with two intermediate rows of trusses in each 44-ft. transverse space, these intermediate longitudinal trusses being supported by transverse trusses placed in the plane of the steep sides of the saw-teeth. Knee-braces are provided for all transverse trusses and for all inside longitudinal trusses in the planes of the columns. Structural steel girts are provided below the trusses on the

two longitudinal outside rows of columns for the support of the siding above a height of 14 ft. above the track. Expansion joints are provided in the frame at three different points in the length of the building.

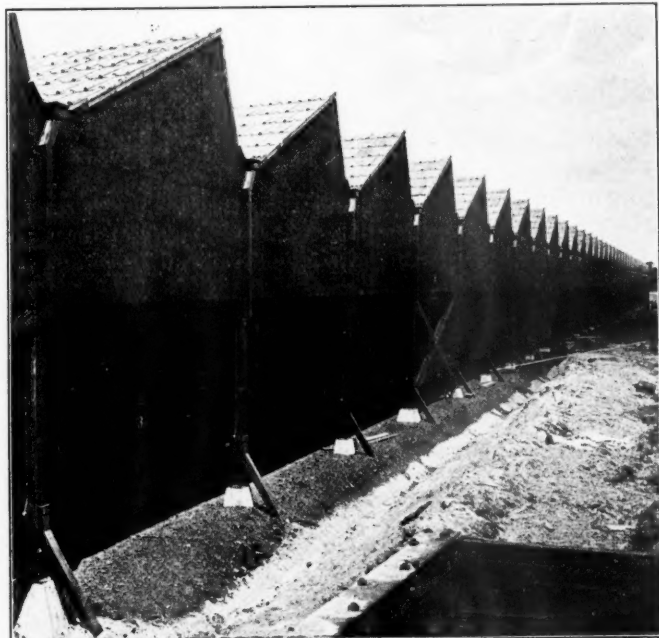
The roof is covered with Federal cement tile which is supported on steel purlins spanning between the longitudinal trusses in rows 4 ft. center to center. An accompanying drawing shows the detail of the gutters, which are given a



Interior View

pitch each way from the center line of the building to downspouts at each end. These gutters and the two rows of slabs of Federal cement tile involved in their construction are covered with a five-ply composition roofing.

The steep sides of the saw-teeth are 11 ft. 1 in. high. Seven feet of this space is occupied by United Steel sash, glazed with $\frac{1}{4}$ -in. ribbed wire glass. The panes are 2 ft.



Side View of the Shed

wide and 7 ft. high, thus avoiding the use of any horizontal mullions. The ends and sides of the roof are finished with vitrified tile copings. The siding at the ends of the gables along the two sides of the building and for a limited area of each end of the building consists of No. 20 black

corrugated iron. Thirty tons of this material was used.

The steel columns are supported on concrete pedestals $4\frac{1}{2}$ and 5 ft. high, requiring a total of 478 cu. yd. of concrete and 900 cu. yd. of excavation. This excavation was made by hand and the concrete was placed by wheeling to the individual pedestals from a concrete plant located adjacent to the site of the building.

The ground space for the building, other than that formerly used for the car repair yards, required grading to the extent of 16,000 cu. yd., this being entirely excavation. The material was removed by an American ditcher, loading flat cars which were hauled 50 miles to improvement work being done on the lines of the Yazoo & Mississippi Valley.

The erection of the steel work was carried on without interference with the car repair work, by means of two platform derricks with 60-ft. booms mounted on timber dollies rolling on skidways placed 8 ft. center to center. These derricks were located, one each, in the lines of longitudinal columns 44 ft. each side of the center line of the building and started the erection at one end of the structure, backing away as the work progressed. With 60-ft. booms the necessary maximum reach of 44 ft. was easily accomplished. The car repair operations were interrupted only at the point in the length of the building where the erection was in progress as necessitated to afford clear space for the swing of the derrick booms. The transverse truss and the two intermediate longitudinal trusses of each bay were assembled on the ground and erected as a unit.

The erection of the tile, glass and roofing offered no interference whatever with the car repair work. Part of the additional space utilized for the car repair sheds was previously occupied by several old buildings which were removed just before the steel frame was erected.

The design and construction of these sheds was carried on under the general direction of A. S. Baldwin, chief engineer of the Illinois Central, with F. R. Judd, engineer of buildings, in direct charge of the design and W. I. Deadrick, Memphis, Tenn., in charge of construction. The structural steel frame work was fabricated by the American Bridge Company and was erected by the Kelly-Atkinson Company, Chicago. E. H. Walsh & Son, Memphis, Tenn., placed the foundations and sewers, and Nohsey & Schwab, Memphis, placed the composition roofing, sheet metal work and gutters and did the painting.

THE "EIGHT-HOUR" LAW

By H. F. Lane

WASHINGTON, D. C., September 26, 1916.

The Adamson "eight-hour" law has changed the entire aspect of the political campaign. Apparently many people who had been apathetic toward the "issues" with which they were being entertained, or who had been inclined to take it for granted that the present administration would be continued in office, are taking a new interest, and both sides are apparently finding the new theme afforded them by the new law a popular one. President Wilson made his promised reply to the vigorous attacks on the law made by Mr. Hughes in his speech before the Business Men's League at Shadow Lawn on Saturday. He did not return to the subject of his address before the National Grain Dealers' Association at Baltimore on Monday, although it was announced from his headquarters at Long Branch that the President has decided upon this as the keynote of the campaign, to be featured in most of his campaign speeches, and the western national Democratic headquarters at Chicago got into the game with "A Word About the So-Called Eight-Hour Law," by Senator Stone, of Missouri, which it issued for public consumption. Meanwhile, Mr. Hughes has continued his castigation of the surrender of the principle of arbitration in his series of western speeches.

While President Wilson defends his course by explaining

what he proposes to do to supplement the law after election, Mr. Hughes says: "It is idle to excuse the action taken by the Adamson bill by a request for additional legislation with respect to the future. That legislation was not obtained. We are dealing with what was demanded and actually enacted. We have an unjustifiable attempt to use public sentiment with respect to another eight-hour workday in order to justify a bill which does not provide an eight-hour workday, but relates solely to an increase in wages. We have seen the choice of what seemed to be the easier way, which escaped the necessity of a determined stand for principles. We have seen what has appeared to be the consideration of immediate political expediency at the expense of public welfare."

President Wilson discusses the law as if it provided for a real eight-hour workday, under which the train employees would work eight hours a day and no more. He says: "We believe in the eight-hour day because a man does better work within eight hours than he does within a more extended day—his efficiency is increased, his spirit in his work is improved and the whole moral and physical vigor of the man is added to." He says the railroad executives asked that the result of the eight-hour day be predicted in advance and the prediction be arbitrated, but that his plan will allow an impartial commission to observe and report upon the results in order that justice may be done the railroads in respect to the cost of the experiment. He does not show, however, how the efficiency of the trainmen will be increased merely by having their pay increased during the period of investigation or thereafter, nor does he say anything about the possibility of amending the law, when it is reconsidered after election, so as to make it provide for the kind of an eight-hour day he is talking about.

He also insists that the remainder of the program which he outlined to Congress "is going to be proceeded with," including the plan for compulsory investigation of labor disputes before a strike can legally be called. He says: "America is never going to say to any individual, 'You must work whether you want to or not,' but it is privileged to say to an organization of persons, 'You must not interrupt the national life without consulting us.'" Railroad officers could support such a plan enthusiastically, and there is much reason to believe that the public would have found itself in nearly accord if the President or Congress had made just that statement to an organization of persons on the occasion of the recent emergency, but the officers of the trainmen's brotherhoods vigorously opposed such a law and their opposition was allowed to prevail. Samuel Gompers said that a compulsory arbitration law would not prevent strikes, but that it would merely make strikers criminals. It is difficult to understand why the brotherhoods are supporting Mr. Wilson so enthusiastically because of what he has done if they are taking seriously what he says he proposes to do in the future.

The brotherhoods have had printed in the government printing office 400,000 copies of a special edition of the Congressional Record containing reprints of the speeches made in the Senate and in the House during the debate on the Adamson bill on September 1 and 2, together with 400,000 copies of the proceedings at the hearing before the Senate Committee on Interstate Commerce, at which the four officers of the brotherhoods and representatives of the railroads and of the shippers expressed their views as to the proposed legislation. These will be distributed among their members, so that, as Warren S. Stone says, labor may "know who is friendly to its interests, and who is not."

An impression got into print last week that the railroad presidents were beginning to calculate more on what the administration could do for them in the future than on what it had done to them in the past. This was promptly refuted in a statement issued by Frank Trumbull, chairman of the Railway Executives' Advisory Committee, stating that there

had been "no change of attitude on the part of the executives as a whole in this matter," but that they are proceeding in an orderly way to ascertain the effect of the law as a practical operating problem and its legal status.

Investigation of the operating aspect of the law is being carried on by the National Conference Committee of the Railways, that had charge of the negotiations with the brotherhoods, and the committee of executives, headed by President Holden, of the Burlington, that conducted the negotiations with the President still has under consideration the other aspects of the problem. Howard Elliott, president and chairman of the New Haven, in a letter to the New York Times, states that "as an individual and as an officer of a railroad company I feel it to be my duty to have that law tested, if possible. I feel it my duty, in a legal and orderly way, to have the law investigated and interpreted in order that the sober second thought of the American people can be brought into action before any further legislation of this character is passed."

Meanwhile the Switchmen's Union of North America, which presented to the railroads demands similar to those of the four brotherhoods, apparently intends to see what it can get by the process of arbitration, instead of depending entirely on the new law, which of course applies to its members just as it does to the trainmen in the other organizations. This organization, which contains less members than its rival, the Brotherhood of Railroad Trainmen, agreed to submit its demands, together with the contingent proposals of the railways, to arbitration under the Newlands law, after the brotherhoods had rejected a similar proposal. The United States Board of Mediation and Conciliation, through whose offices the arbitration agreement was brought about, has just been notified that the union has selected as its arbitrators J. B. Connors, assistant president, and W. A. Titus, vice-president, of the Switchmen's Union. The railroads are expected to name two arbitrators within a few days.

LAW WHICH INCREASE RAILWAY EXPENSES

Although the sixty-fourth Congress at its session recently closed has passed comparatively few laws affecting railroads, the eight-hour law, which it is estimated will increase the wages of the train employees at the rate of about \$60,000,000 a year, is not the only one which will greatly increase the expenses of the roads. Another, which has apparently attracted little attention, is the corporation tax law provision of the revenue law, which provides for a tax of two per cent annually, instead of one per cent as before, upon the total net income received in the preceding year from all sources "by every corporation, joint-stock company or association or insurance company." The Pomerene bill of lading law is also likely to be more or less expensive in increasing the liability of the roads under bills of lading. Congress also amended the hours of service law to provide for a minimum fine of \$100 for violations, whereas the law formerly provided only a maximum of \$500. The Decker clearance law, providing for greatly increased clearances between cars and locomotives and structures, which was reported to the House from the Committee on Interstate and Foreign Commerce, was not called up for passage during the session.

Undoubtedly the most important action affecting the railroads, at least in its possibilities, was the creation of the Newlands committee to make a study of the entire subject of railway regulation. Probably for the reason that it was preferred to withhold action until this committee has made its report the bill providing for a reorganization and an increase in the membership of the Interstate Commerce Commission was not passed. Another law of great importance which was enacted was the rider to the postoffice appropriation bill directing the Interstate Commerce Commission to fix

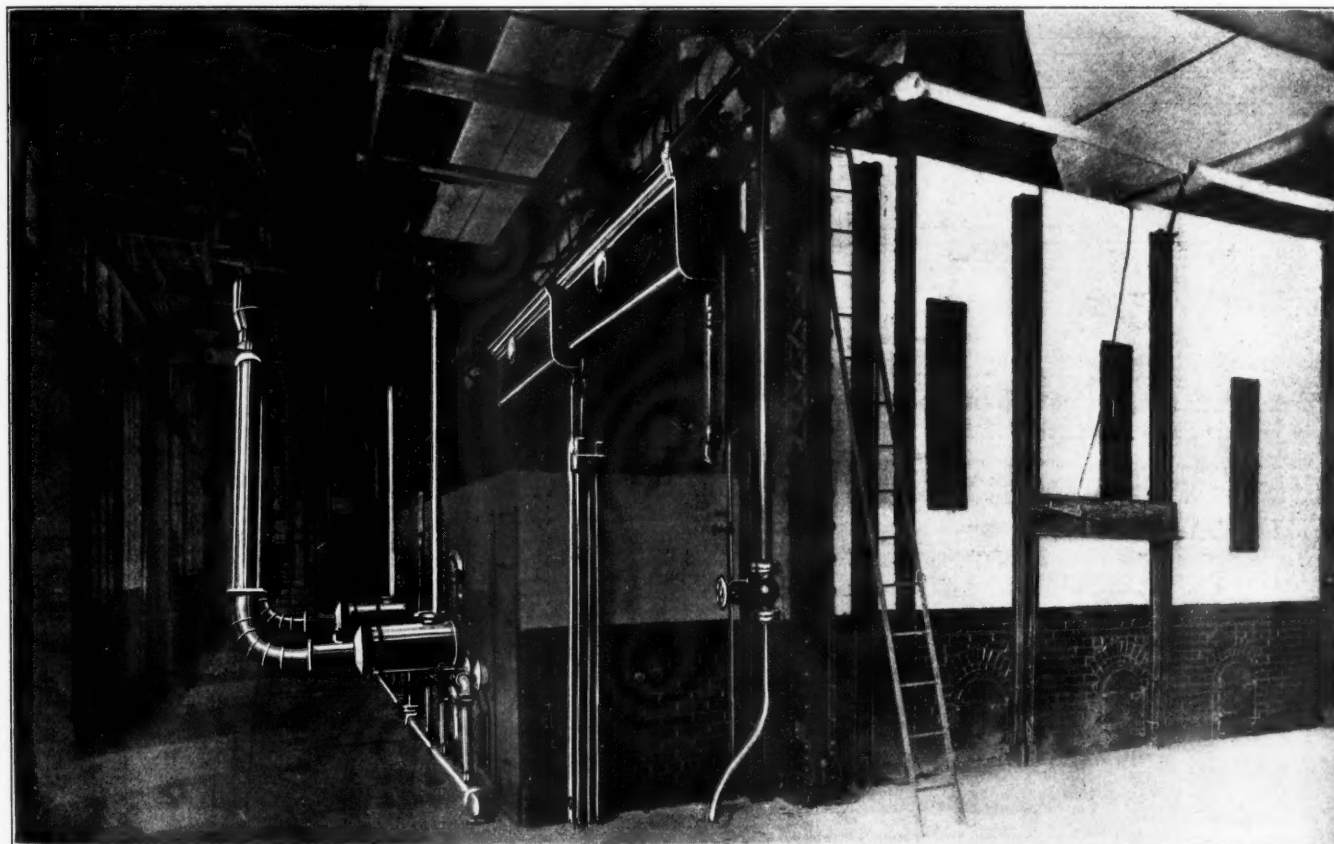
and determine from time to time fair and reasonable rates for the transportation of mail matter by common carriers and to prescribe methods for ascertaining the compensation of the carriers for handling the mails. The Cummins amendment to the interstate commerce law relieves the railroads of the necessity of requiring declarations of the value of baggage.

STATIONARY BOILERS FIRED BY PULVERIZED COAL ON THE MISSOURI, KANSAS & TEXAS

During the winter of 1912, when the natural gas supply was limited in quantity and fuel oil hard to obtain in Kansas, the officers of the Missouri, Kansas & Texas decided to investigate other methods for generating steam in the boilers at the powerhouse of the shops at Parsons, Kan. There were at this point, eight 250-hp. boilers of the Heine water tube type, equipped for using natural gas and oil as fuel. Some of the other fuels available in the district, which would be within an economical range as to cost delivered at the

Fuller Engineering Company, Allentown, Pa., and the material and machinery was delivered in the fall of 1913. Owing to financial conditions, it was thought unwise to make the change at that time, but in the early part of 1916, owing to the abnormal price of fuel oil, orders were given to proceed with the work, and the plant was placed in successful operation August 1, 1916.

The equipment for pulverizing and drying fuel is contained in a separate building, which is located near one end of the boiler house and the coal is dumped from the cars directly into a concrete track hopper of 50 tons capacity adjoining this building. The plant is designed to handle either mine run or slack coal and immediately below the track hopper is placed a set of Jeffrey double spike-tooth rolls, which will reduce lumps up to 12 in. by 18 in. to 5-in. cubes or less in one operation. As the coal passes through this crusher, it is discharged onto a 20-in. inclined belt conveyor, which discharges directly into a set of Lehigh corrugated rolls. The upper end of the belt conveyor passes over a Cutler-Hammer magnetic separator pulley, the function of which



Heine Type Horizontal Tubular Boilers Burning Pulverized Fuel, at the Parsons, Kan., Shops of the Missouri, Kansas & Texas

plant, were soft coals from the Mineral mine in Kansas, the McAlester and Lehigh mines in Oklahoma, and lignite from Texas, with the following analysis:

Kind of coal	Fixed carbon	Volatile	Ash	Moisture	B. t. u.
Mineral	45.22	26.39	20.38	8.01	10,640
McAlester	47.07	32.37	14.29	6.27	11,837
Lehigh	41.40	31.28	19.29	8.03	11,200
Lignite	25.50	33.95	7.58	32.97	7,548

The sulphur, separately determined, ranged from approximately 3 to 5 per cent in the various soft coals.

Owing to the ash and moisture content of these fuels, it was determined to investigate methods of using them in pulverized form, as it was known that pulverized bituminous coal has been in successful use in the cement industry, in a major portion of the plants throughout the country. This investigation resulted in the placing of a contract for the necessary equipment at the Parsons powerhouse with the

is to remove any pieces of iron or steel which may be in the coal and retain them on the belt until it passes off the underside of the pulley, the metal then dropping to the floor behind the crusher rolls. The coal from these rolls is reduced to pass through a $\frac{3}{4}$ -in. mesh and discharges directly into a dust-tight elevator, from which it is distributed by a 12-in. screw conveyor into a storage bin over the coal dryer, of 50 tons capacity.

The equipment throughout the pulverizer plant is operated by Westinghouse three phase, 60 cycle motors at 440 volts. The crusher below the receiving hopper is driven by a 10-hp. belt connected motor, while the inclined belt conveyor and the second crusher are operated by one 15-hp. belt connected motor. This arrangement of the drive obviates any possibility of choking the second crusher. The elevator and

screw conveyor, by means of which the coal is taken from the rolls and delivered to the storage bin, are operated by a 10-hp. back geared induction motor.

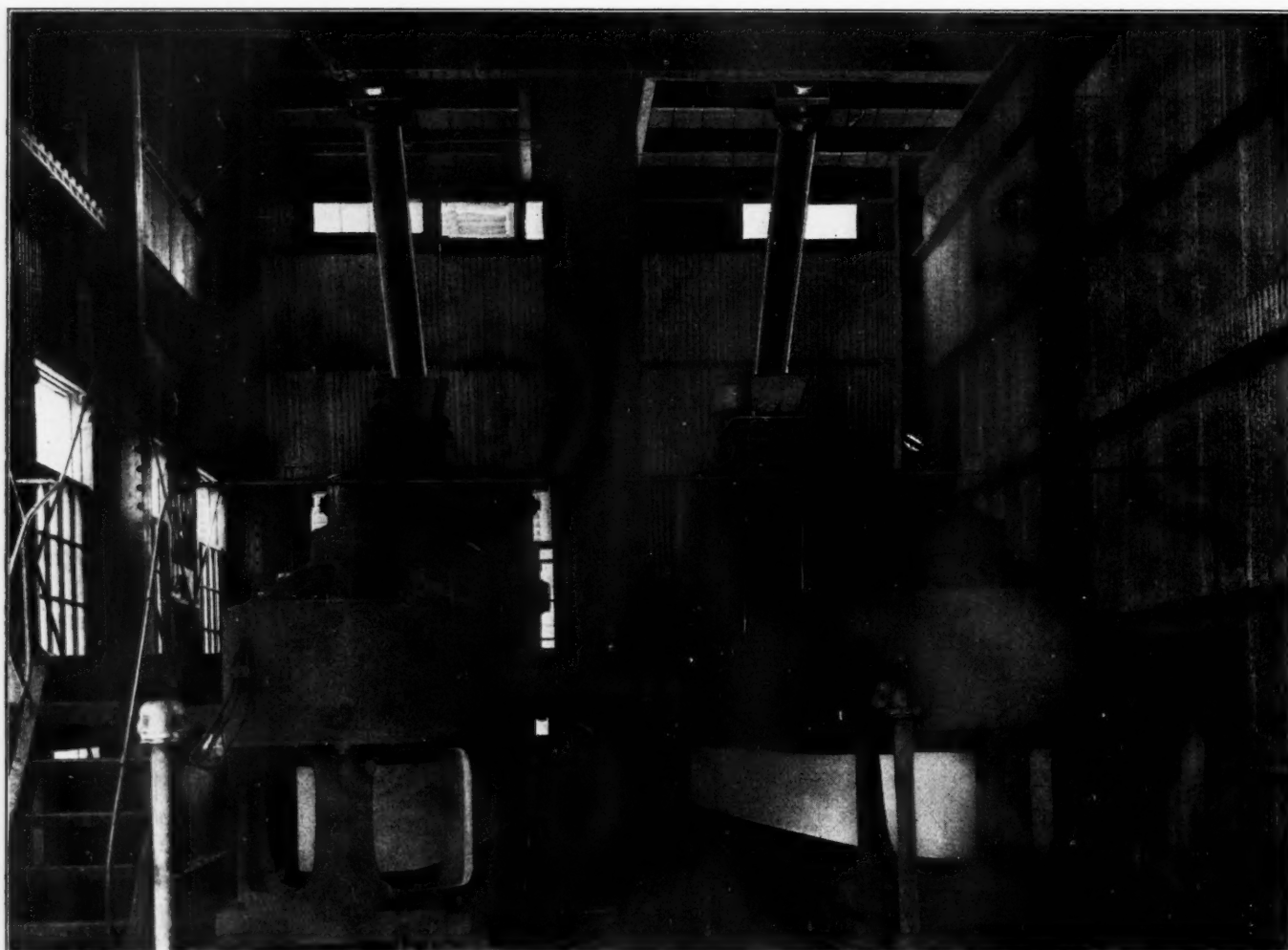
Coal may be drawn from any part of the storage bin and delivered by means of a screw conveyor to the Fuller Engineering Company's indirect fired dryer, a chute from the screw conveyor being provided for the delivery of coal to the floor to be used in firing the dryer furnace. The dryer is driven by a 10-hp. induction motor and will evaporate the moisture from coal containing 10 per cent moisture, to $\frac{1}{2}$ per cent at the rate of eight tons per hour. In order that lignite, containing from 30 to 50 per cent moisture may be handled, the dryer is arranged so that the material may be passed through as many times as may be necessary to reduce the moisture to the desired amount before the coal is delivered to the pulverizer.

From the dryer the coal is discharged directly into a second

through a steel bridge covered with corrugated sides and roof.

The capacity of the pulverizer plant is 180 tons per day of 24 hours and the requirements of the present boiler installation are about 96 tons in 24 hours. Arrangements are being made for the trial of pulverized coal in locomotive service, one engine now receiving the pulverized fuel burning equipment, and an outside storage bin will be added to the plant to take care of the locomotive fuel supply.

The boilers in the powerhouse are arranged in pairs and as equipped for burning gas and oil, the combustion takes place in the furnace directly under the heating surface of the boiler. For pulverized fuel, however, a Dutch oven furnace has been built on the front of the boiler setting, it having been found that the best results are obtained in this manner. The equipment for burning the fuel is simple. Each pair of boilers is provided with a blower, driven by a 10-hp. constant speed direct current motor, a blast pipe



Fuller-Lehigh 42-in. Pulverizer Mills at the Parsons Plant

dust-tight elevator, delivering to a 12-in. screw conveyor, both of which are driven by a 10-hp. induction motor. The conveyor discharges the fuel into two bins of 40 tons capacity each, which feed two 42-in. Fuller-Lehigh pulverizing mills. Each pulverizer is driven by a 60-hp. vertical motor and in one operation reduces the fuel so that 95 per cent will pass through a 100 mesh screen and 85 per cent through a 200 mesh screen, at the rate of four tons per hour. As the fuel leaves the pulverizer it is discharged into a third dust-tight elevator and delivered to a 12-in. screw conveyor, which carries it to the bins in front of the boilers. This elevator and screw are driven by a 15-hp. induction motor, the conveyor passing from the pulverizer building to the powerhouse

from this blower entering the rear end of an induction tube passing through the wall of each furnace. Each blast pipe is fitted with a gate for controlling the air jet to the combustion tube. The fuel from the bins passes through a 4-in. screw feeder, the speed of which accurately determines the rate at which the coal is delivered to the furnace. Each of these feeders is driven by a 2-hp. variable speed motor. The fuel from the feeders is led by gravity through a pipe entering the top of the induction tube near the front of the furnace. The action of the high velocity jet from the blast pipe induces a large volume of air at lower velocity through the induction tube; the fuel is caught by this current, with which it is thoroughly mixed, and enters the furnace at a low velocity,

burning with a lazy flame which practically fills the combustion chamber.

The fuel bins in front of the boilers have a capacity equivalent to 16 hours service at boiler rating. The bins and supports are of steel and the bins are closed with steel covers which are dust-tight. Each bin is hoppers and is equipped with a hand-operated agitator, the purpose of which is to prevent the bridging over of fuel in the hopper.

Considerable experimental work has been done in order to secure the best furnace arrangement and to provide an effective control of combustion to meet the requirements of varying loads on the boilers. As installed for the use of gas, the boilers were provided with three-pass horizontal baffles. In the pulverized fuel fired boilers these baffles are being replaced by a vertical three-pass arrangement from which excellent results have been obtained.

Various tests have been made with the different fuels mentioned and all of them were burned with entire success, an effective distribution of the heat throughout the heating surface of the boiler being obtained and the stack temperatures being low. No deposit of ash settled anywhere in the boiler that could not readily be dislodged with an ordinary air blast. With Texas lignite and a boiler output of 110 per cent of rated capacity, an equivalent evaporation of 8.81 lb. of water per pound of combustible was obtained. The coal as fired, had a heating value of 11,250 B. t. u. and contained 7 per cent moisture, the dryer not being arranged to handle this class of fuel regularly. At about 92 per cent of rated capacity an equivalent evaporation of 10.9 lb. of water per lb. of combustible was obtained with Mineral slack (Cherokee County, Kansas), the fuel as fired containing one per cent moisture. Including the cost of pulverizing, which was 35 cents per ton, the cost of this coal delivered to the bin was \$1.795 per ton. The cost of evaporating 1,000 lb. of water was 11.6 cents while with natural gas, the heating value of which is about 940 B. t. u. per cubic foot, the cost of evaporating 1,000 lb. of water was 16 cents, the gas being purchased at 12.5 cents per 1,000 cu. ft.

The normal coal feed is arranged to develop about the rated capacity of the boiler. At maximum feed, however, the boilers may be forced to 142 per cent of rated capacity. No difficulty has been experienced from abnormal furnace temperatures which would tend to destroy the furnace walls. Even under forced conditions the furnace temperature does not exceed 2,350 deg. F., and under normal conditions it is about 2,100 deg. F.

THE ADVISORY COMMITTEE AND THE EIGHT-HOUR LAW

Frank Trumbull, chairman of the Railway Executives' Advisory Committee, has issued the following statement to refute inaccuracies which had appeared in newspaper accounts of the meeting of the Advisory Committee:

"An entirely erroneous impression concerning the attitude of the railway executives toward the Adamson eight-hour law has been given circulation through inaccurate reports of the proceedings of the meeting of the Railway Executives' Advisory Committee which was held at this office on Wednesday (September 20). There has been no change of attitude on the part of the executives as a whole on this matter, and in whatever deliberations they have pursued concerning it they have proceeded in an orderly way to ascertain, if possible, first, the effect of the law as a practical operating problem, and, second, its legal status.

"Investigation of the practical problem involved is being pursued by the managers of the roads through the National Conference Committee of the Railways, Elisha Lee, chairman, and a study of the legal questions has been referred to the counsel of the various railways for investigation and future consideration. The railway executives have, through-

out this whole controversy, taken a position squarely in favor of investigation before action. In harmony with that policy, they are seeking by a study of every phase of the subject and a careful investigation into all of its bearings to prepare the way for the proper course to be pursued.

"There is today, as there was on the day of its passage, great dissatisfaction with the so-called eight-hour act, both in principle and the manner of its enactment. There has been no change of feeling on these points, nor, indeed, could there be, in the light of the facts.

"The committee of executives which conducted the negotiations for the railways at Washington, of which Hale Holden is chairman, is continued in its activities for the railroads in this matter, and has under consideration the problems to be met.

"There are various questions of policy, aside from those of an operating or legal nature, which must be decided. If the railway executives, on advice of counsel, should conclude that the law is invalid or even unfair, they must then consider what is to be their attitude to their shareholders in the matter of its enforcement. They must also consider their duty to the public in asking for an increase in railroad rates, as suggested by the administration. They must meet the question whether or not, under the eight-hour law, they must require men who now work less than eight hours to give a full eight hours of service. These and other questions of policy are all to be considered before decision or action.

"There was nothing in the deliberations of the executives on the day in question to warrant the reports which have been circulated."

Howard Elliott, president of the New York, New Haven & Hartford, sent a letter to the New York Times, dated September 22, referring to an editorial entitled "Second Thought," which was based on the above-mentioned misconception of the meeting of the Advisory Committee. In it he said:

"For your information, may I have the privilege of stating that I am a member of the Railway Executives' Advisory Committee and attended the meeting on Wednesday. No action was taken at that meeting that justified the statement appearing in this morning's editorial. The position of the owners and managers is the same today as it was in Washington when they urged the President and Congress not to take a 'leap in the dark' in this matter. They are, however, citizens and will obey the Adamson law if it goes into effect. As an individual and as an officer of a railroad company I feel it to be my duty to have that law tested, if possible—in the interest of 35,000 employees on the New Haven road who are not members of the so-called Big Four Brotherhoods, in the interest of about 45,000 holders of New Haven securities and in the interest of nearly 10,000,000 people living in New England and New York along the line of the road and who are more or less dependent upon its ability to add to its facilities. Therefore, I feel it to be my duty, in a legal and orderly way, to have the law investigated and interpreted in order that the sober second thought of the American people can be brought into action before any further legislation of this character is passed."

MANGANESE ORE AT ILSEDE.—Much of the manganese ore wanted for the German steel industry now comes from the Ilsederhütte, near Peine, east of Hanover. The occurrence of manganese ores was known, but the ores were practically inaccessible, lying immediately underneath the village of Ilse. A large portion of this village had to be removed; this has been done since the war began, and the works are said to have paid 33 per cent in dividends last year. The district of Peine also produces petroleum, and there is a petroleum refinery at Peine.—*Engineering.*

TRAIN ACCIDENTS IN AUGUST¹

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of August, 1916:

Collisions						
Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
9.	Southern	Crosswell.	bc	P. & F.	1	3
10.	N. Y., Susq. & W.	Blairstown.	rc	P. & F.	0	3
12.	Texas & Pacific..... Galveston H. & S. A.	El Paso.	xc	P. & F.	0	17
15.	Balt. & Ohio.....	Vance, Pa.	bc	F. & F.	3	3
16.	Wabash Ill. Traction	Venice.	xc	F. & F.	0	4
Derailments						
Date	Road	Place	Cause of Derailm't	Kind of train	Kil'd	Inj'd
†1.	M., K. & Texas.....	Lancaster.	b. rail	P.	3	20
4.	Lake Erie & W.....	South Bend.	boiler	P.	2	7
8.	Missouri Pacific	Elmo, Kan.	b. rail	P.	0	0
11.	Southern	Bellwood.	neg.	P.	0	2
11.	Great Northern	Boru, Mont.	ms	P.	1	25
11.	Penn.	Mt. Pleasant.	.....	F.	1	2
12.	Atchison, T. & S. F.	La Rose.	boiler	F.	2	1
12.	Erie	Youngstown.	acc. obst.	P.	0	2
19.	Atchison, T. & S. F.	Deming	washout	F.	1	2
19.	Cleve., C. & St. L.	Seneca.	unx	F.	0	0
24.	Lehigh & N. E.	Nazareth.	unx	F.	3	0
26.	Phila., Balt. & W.	Dover.	der. sw.	F.	1	2

The trains in collision on the Southern Railway, at Crosswell, S. C., on the 9th of August were a southbound passenger, No. 11, and a northbound freight. The passenger train was standing at the station when the freight approached on the main track, at uncontrollable speed, when it should have entered the side track before reaching the station. The engineer of the passenger train was killed and three trainmen were injured.

The trains in collision near Blairstown, N. J., on the 10th were an eastbound passenger and an eastbound freight. The passenger ran into the freight train and wrecked the caboose. Three trainmen were injured. The freight had encroached on the time of the passenger train without proper flag protection.

The trains in collision at El Paso, Tex., on the 12th were Texas & Pacific westbound passenger No. 5, and a switching engine of the Galveston, Harrisburg & San Antonio, the switching engine being on the main track without right. Seventeen passengers were injured, none seriously.

The trains in collision at Vance, Pa., on the 15th were through freights. Three trainmen were killed and eight were injured. The cause of the collision was the neglect of the men in charge of the inferior train, which had run past the appointed meeting station.

The trains in collision at Venice, Ill., on the 16th were a passenger train of the Wabash, and a train of the Illinois Traction Company consisting of a motor passenger car and an empty sleeping car. The steam engine ran into the side of the electric train, at the crossing of the two roads, and badly damaged one of the coaches. Four passengers were slightly injured. The movement of trains over this crossing is controlled by a flagman whose flag signal is said to have been misinterpreted.

The train derailed near Lancaster, Tex., on the 1st was a southbound passenger, known as the "Texas Special." The engine and four cars were ditched and the engineer, fireman and one passenger were killed. Twenty or more passengers were injured. The cause of the derailment was a broken rail.

The train derailed near South Bend, Ind., on the 4th was

a northbound passenger. The boiler of the engine exploded and the first two cars were derailed. The engineer and fireman were killed by the explosion and one trainman and six passengers were slightly injured. The cause of the explosion was not determined.

The train derailed at Elmo, Kan., on the 8th was westbound passenger number 4. The train was running at moderate speed and no passengers were seriously injured. The derailment was caused by a broken rail.

The train derailed at Bellwood, Ga., on the 11th at about 12:15 a. m. was eastbound passenger No. 36, drawn by two locomotives. Both of the engines were overturned, and the engineer and fireman of the leading engine were scalded. The derailment occurred at a derailing switch, the signal of which appears to have been disregarded.

The train derailed on the Great Northern near Boru, Mont., on the 11th was eastbound passenger No. 44. Two engines and the first three cars were ditched. One engineer was killed and six passengers and nineteen employees were injured. The cause of the derailment was a misplaced switch, said to have been left in the wrong position by track repairers.

The train derailed near Mount Pleasant, Pa., the 11th was a northbound freight, and the engine was overturned. Seven cars were piled upon the overturned engine, and the fireman was killed. The engineer and one trainman were injured.

The train derailed near La Rose, Ill., on the 12th was an eastbound freight. The engineer and fireman were killed by the explosion of the boiler, and one brakeman was injured. The cause of the explosion was low water.

The train derailed near Youngstown, Ohio, on the 12th was eastbound passenger No. 620. Seven coaches left the rails, and two passengers were injured. The cause of the derailment was a stray piece of iron rod lying on or near the track.

The train derailed near Deming, N. M., on the 19th, was an eastbound freight. The engine and 5 cars were wrecked and piled up in a gully caused by a washout. The engineer, fireman and conductor were injured, the engineer fatally.

The train derailed near Seneca, Ill., on the 19th was a westbound mixed train. Four cars fell through the bridge over the Illinois river. The bridge appears to have been knocked down by a derailed car. The cause of the derailment was not determined.

The train derailed near Nazareth, Pa., on the 24th was a westbound freight. The derailment occurred within yard limits but it appears to have been due to excessive speed. The locomotive (at the head of the train) was running backwards. The leading wheels mounted the rail on a curve and the engine and five cars were piled up in a bad wreck. The engineer, fireman and one brakeman were killed. These were the only persons on the train, and the cause of the derailment has not been discovered. Both the engine and the track were nearly new, and in good condition.

The train derailed near Dover, Del., on the 26th, about 11 p. m., was an extra freight. The engine ran over a derailing device and was overturned. The engineer was killed and two other employees were injured.

Electric Car Accidents. Near Johnstown, Pa., on the 12th of August, a trolley car of the Southern Cambria Traction Company collided with a standing car at the foot of a hill, having become uncontrollable on the steep descending grade, and 25 persons, including the two motormen, were killed or fatally injured.

THREATENED RAILWAY STRIKE IN GREECE.—The employees on the Peloponnesus and Athens-Piræus railways, following the example of the tramway employees, threaten to strike if they are not granted an increase of pay.

¹Abbreviations and marks used in Accident List:
rc, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—F, or Pass., Passenger train—F, or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

A Catechism of the Adamson Pay Day Law

Questions and Answers Making Clear What It Is and What It Isn't—Merely an Act to Increase Wages

Q. What is the "Adamson law?"

A. It is a law designed to give certain railway employees a 21 per cent increase in wages, by insuring them the same pay for eight hours as they now get for 10 hours.

Q. Does the law make eight hours the maximum time these men may work in one day? In other words, does it aim to establish a real eight-hour work day?

A. It does not. They may work any number of hours up to 16 a day, provided they get a wage increase of 21 per cent over the present wages.

Q. Then, it is not a law for a bone fide work-day of eight hours at all?

A. In no sense is it such a law. It is a basic wage plan only, and hence totally different from all other so-called "eight-hour" laws.

Q. Does the law require the men to work a full eight hours to earn a full day's pay?

A. This was not the intent of those responsible for the passage of the law, but this may be held to be its meaning, and that possibility is greatly worrying the men whom the law was intended to specially favor.

Q. Who are those men?

A. The members of the railroad brotherhoods.

Q. What are they?

A. They are the four labor unions which are made up of the men employed in railway train service: (1) the locomotive engineers; (2) the firemen; (3) the conductors; (4) the brakemen, flagmen and yardmen, or switchmen.

Q. Do these men get good wages?

A. They get very high wages. On the western railroads in 1915 all the train service employees (including those who worked only a fraction of the years) earned these wages, on an average:

	Passenger	Freight	Yard
Engineers	\$2,038	\$1,737	\$1,218
Conductors	1,772	1,624	1,292
Firemen	1,218	973	832
Brakemen	912	1,000	1,026

On all the railroads in 1915 three-quarters of the train employees earned these wages:

	Passenger		Freight		Yard	
	Range	Average	Range	Average	Range	Average
Engineers	\$1,641 3,983	\$2,067	\$1,455 3,505	\$1,892	\$1,005 2,445	\$1,526
Conductors	1,543 3,004	1,850	1,353 2,932	1,719	1,055 2,045	1,310
Firemen	943 2,078	1,203	648 2,059	1,117	406 1,633	924
Brakemen	854 1,736	1,095	755 1,961	1,013	753 1,821	1,076

These are the highest paid workers in railroad service and while these men constitute only 18 per cent of the employees, their share of the pay roll is 28 per cent.

Q. Do they work every day in the year to make these wages?

A. They do not. A record kept for a typical month (October, 1913) for engineers and firemen on western roads showed they worked only 23.4 days per month. So they have more days to rest than does other labor having steady jobs.

Q. How are their wages calculated?

A. For men in freight service, being those who are now complaining, they are calculated on the basis of a day of 10 hours or less, or 100 miles or less. If a man makes his run in 10 hours or less he gets pay for the full day, even though he works only six or seven hours. If his

run takes over 10 hours, he gets pay pro rata for the time in excess of ten hours; that is, if his excess time is one hour, he gets one and one-tenth his day's pay and so on. If his run is over 100 miles, he gets pay pro rata for the mileage in excess of 100 miles, no matter how few hours it takes to make the run. If his run is over 100 miles and takes over 10 hours, he gets his extra pay either for the excess hours or for the excess mileage, whichever makes the higher amount of pay for him.

Q. How have these wages and conditions been arrived at?

A. They have been arrived at by negotiations from time to time during the past 30 years, originally with the individual roads and of recent years by general conferences of committees representing the brotherhoods and the railroads; and more recently by arbitration covering large parts of the country. There have been four important arbitrations:

1. Between eastern railroads and conductors and brakemen. Submitted to arbitration July 26, 1913. Arbitrators were: Seth Low, chairman; A. H. Smith, John H. Finley, L. E. Sheppard, W. W. Atterbury, D. L. Cease.

2. Between eastern railroads and locomotive engineers. Submitted to arbitration April 30, 1912. Arbitrators were: Charles R. Van Hise, chairman; Oscar S. Straus, Otto M. Eidlitz, P. H. Morrissey, Frederick N. Judson, Albert Shaw, Daniel Willard.

3. Between eastern railroads and firemen. Submitted to arbitration February 18, 1913. Arbitrators were: William L. Chambers, chairman; W. W. Atterbury, Albert Phillips.

4. Between western railroads and engineers and firemen. Submitted to arbitration August 3, 1914. Arbitrators were: J. C. Pritchard, chairman; Charles Nagel, H. E. Byram, W. L. Park, F. A. Burgess, Timothy Shea.

In each the men asked for much more than they expected to get and were given generous awards—probably all they hoped to get. In none of these cases was the railroads' request granted for arbitration of certain of their grievances; so that the railroads always lost without any compensating gains whatever.

Q. What was the recent demand of the brotherhoods?

A. It was that they should be paid for the first eight hours of their run the same amount which they now receive for the first 10 hours; and that for any time in excess of eight hours they should be paid $1\frac{1}{2}$ times the hourly rate. For example, if a man's pay is now \$4.00 for 10 hours, this demand meant that he should get \$4.00 for the first eight hours and then should get 75 cents per hour for time in excess of eight hours, thus making for 10 hours' work \$5.50 or an increase of $37\frac{1}{2}$ per cent.

Q. Were they not trying to get their work cut down to eight hours a day?

A. They were not. They were and are glad to work the additional time so as to get additional money. They would oppose any effort to prohibit them from working only eight hours a day.

Q. Then they were trying to get more money instead of trying to get a shorter day?

A. That is exactly what they were trying to do.

Q. Would their demand have made any important increase in the expenses of the railroads?

A. The railroads estimated that it would cost them about \$60,000,000 additional merely to grant this demand of the men for increased pay even if the excess time over eight hours was paid for only at the hourly rate instead of at $1\frac{1}{2}$ times the hourly rate; and estimated it would have

cost an additional \$50,000,000 if the excess time had been paid for at $1\frac{1}{2}$ times the hourly rate.

Q. What answer did the railroad companies make to the demands?

A. The railroads said the trainmen were already paid very high wages and could not reasonably demand still further increases; that they already got wages which were relatively much higher than the other railroad employees got and that it was unjust to increase this disparity still further; that the railroads could not stand the additional cost unless the freight and passenger rates paid by the general public should be increased; but that the railroads were willing to submit the whole matter, including requests on their part for certain changes in some extra or so-called double pay schedules, to the Interstate Commerce Commission or to arbitrators selected according to the Act of Congress known as the Newlands act, or to arbitrators appointed by the President; that such arbitrators could examine all the facts and hear all the reasons for and against the claims of each side and then declare what they thought was reasonable and just, and that the railroads would abide by that decision.

Q. What did the brotherhoods say to the railroads' position?

A. They said they would not arbitrate and would not await any inquiry into the reasonableness or unreasonableness of their demands and would strike and tie up every railroad in the United States so that neither freight nor passengers could move unless their demands were granted.

Q. What happened then?

A. After various efforts at mediation by other federal officers, President Wilson summoned both sides to Washington and indicated that he had decided that the railroads ought to pay the men for the first eight hours of their work the full pay which the various conferences and arbitrators had fixed in the past as reasonable for 10 hours' work, and should pay for any time in excess of eight hours at the hourly rate. He suggested that the further demand of the men for the still higher pay of $1\frac{1}{2}$ times the hourly rate for time in excess of eight hours and all other questions at issue should be held in abeyance and be the subject of consideration in the future. He said he would use his influence to get freight and passenger rates increased so as to put the burden on the general public of paying for the heavy increased pay (estimated by the railroads at \$60,000,000 per year) which his view would give to the men.

Q. Does this mean that President Wilson proposed that the railroads should pay the men additional wages for the same service over and above the wages which had been fixed in the various conferences and arbitrations in the past?

A. It does.

Q. Had President Wilson, before deciding that this heavy increase in wages should be given to the trainmen, had a hearing of all parties concerned so as to get the facts as understood by both sides and so as to hear their arguments and so as to decide, on the basis of those facts and arguments, that his decision was just?

A. He had not. He made up his mind before summoning either side before him and without giving either side an opportunity to present its case or criticize the case which might be presented by the other side.

Q. Did President Wilson claim that these matters ought to be settled in this way by the President of the United States, himself, without a full hearing of both sides through the usual processes of arbitration?

A. No. He said his faith in arbitration was not shaken, but that the eight hour day was not arbitrable and that there was no way to compel arbitration of any of the questions and no way to prevent the brotherhoods from tying up all the railroads in the United States and hence that the men must be given what they demanded in order to keep

them from stopping all the rail transportation in the country.

Q. Did President Wilson first urge the brotherhoods to agree to submit all their demands to arbitration and impress upon them that arbitration had the sanction of society and that public sentiment would not support a strike to enforce demands which the brotherhoods refused to arbitrate?

A. He did not. He started out by proposing that the brotherhoods be given without arbitration or investigation the principal increase in wages which they were demanding and that the remaining increase in wages be left open for future consideration.

Q. What was the position of the brotherhoods on this proposition?

A. They were tickled to death to accept it, although they made a show of reluctance. They knew they would get thereby far greater increases in wages than they could possibly hope for as the result of any impartial hearing and investigation.

Q. What was the position of the railroads?

A. The railroads claimed it was unjust to ask them, and through them the general public, thus to "stand and deliver" in answer to this hold-up by the brotherhoods without any opportunity for arbitration; that to yield to this hold-up would simply encourage other hold-ups and that the only proper course was for the railroads and the public to fight this thing out now, instead of whetting the appetites of the brotherhood leaders by tamely submitting to their present hold-up. The railroads also pointed out that the President could not guarantee increases in rates so as to put upon the general public the burden of the wage increase for the trainmen which he sought to bring about; that shippers and passengers would strongly oppose any such increase in their burdens and that no one could forecast what the Interstate Commerce Commission would do about granting any increases; and that it would be a betrayal of the public for the railroads to help create this additional burden, unless and until impartial arbitration had determined that it was a necessary burden.

Q. What happened then?

A. It developed that while these discussions were proceeding, the brotherhood leaders had already called a strike throughout the United States of all trainmen, both passenger and freight, to take effect at 7 a. m., September 4. The President therefore went personally to the Capitol and delivered an address to both Houses of Congress, in which he urged them to prevent the strike by passing a law giving the trainmen the price which they said they had to have to keep them from striking; that is, he asked Congress to pass immediately and without any opportunity for investigation an act requiring the railroads to pay the trainmen for the first eight hours of service the wages which had been fixed by various conferences and arbitrations as the reasonable wages for the first 10 hours of service, and to pay overtime at the hourly rate for the excess time over eight hours. The brotherhoods indicated that unless this bill was passed and signed by six o'clock Saturday evening, September 2, the rail facilities of the United States would be tied up by strike of all the trainmen, passenger and freight, at 7 o'clock on the next Monday morning.

Q. What did Congress do?

A. It did as it was requested. It hurriedly passed the bill which the brotherhood leaders said was the only thing which would prevent them from tying up the rail transportation of the United States.

Q. Was the bill passed and signed by 6 o'clock Saturday evening, September 2?

A. It was passed, but not signed. Instead the President of the United States made a pledge to the brotherhood chiefs that he would sign the bill on Sunday morning, September 3, and finally the brotherhood chiefs graciously agreed that in consideration of this pledge they would call off the strike

and would let the people of the United States continue to enjoy rail transportation.

Q. Did the President sign the bill so as to pay the price the brotherhood leaders demanded?

A. He did. He signed it with four pens and gave them to the four brotherhood chiefs as souvenirs of their conquest of the President and Congress.

Q. Did Congress have an opportunity to investigate the reasonableness of the increased wages which it voted to the trainmen?

A. It did not. It was admitted on the floor in both Houses that they did not know whether the demands were reasonable or not and that they had to pass the bill to keep the brotherhood chiefs from stopping rail transportation.

Q. Did the President recommend the passage of any other legislation?

A. Yes. He recommended the passage also of a bill prohibiting conspiracies to strike on the railroads except after there had been an impartial investigation and a decision and report as to the reasonableness of the demands.

Q. Would this prohibition of conspiracies to strike in advance of investigation have been sufficient to stop this strike?

A. It would. If this prohibition had been passed it would have prevented the strike and it would have been unnecessary for Congress to increase without investigation the wages of the trainmen and thereby put the Government in the humiliating position of submitting for the first time in the history of the country to an unqualified and unvarnished hold-up under a threat to tie up the business of the country.

Q. What did Congress do as to this additional recommendation?

A. It said there was not time to pass this prohibition which would have vindicated the dignity and power of the United States and that the matter could be considered at the next session.

Q. Would it have required any more time to pass this prohibition than it required to pass the act which yielded to the hold-up of the brotherhoods?

A. It would not. But Congress was willing to pass without the necessary time for investigation and consideration a bill which gave the brotherhoods the price they demanded; and was unwilling to pass, even with full time for investigation and consideration, the bill which would have vindicated the honor and power of the United States. The President and Congress knew for months in advance that the brotherhoods were threatening to strike and tie up all the railroads in the country unless their demands were granted without opportunity for arbitration. But neither the President nor Congress made any effort to provide legislation to prevent the carrying out of such a disastrous conspiracy and thereby vindicate the dignity and power of the country.

NEW RAIL MILL OF THE CARNEGIE STEEL COMPANY AT BESSEMER, PA.

The demand for open hearth rails and rails of larger area of cross section has caused the Carnegie Steel Company to construct an entirely new rail mill from the open hearth furnaces to the loading platform. Active work on the building of the Edgar Thomson Works dates back as far as 1872, the first steel rail having been rolled in 1875. The plant has been steadily enlarged in the 40 years since the first rail was rolled, and at the present time consists of 11 modern blast furnaces, a Bessemer department of four 15-ton converters, 14 open hearth furnaces, 4 rail mills, a splice bar shop, 3 foundries, a briquetting plant, auxiliary mills and a repair shop.

The limit of economic manufacture was reached on the

old rail mill, known as No. 1, which produces rails up to 100 lb. per yard from an ingot 17½ in. by 19½ in. at its bottom, and 15 in. by 17 in. at its top. To produce a rail of heavier weight and greater height called for the construction of a heavier mill, which has recently been completed and is capable of rolling the heaviest rails that will be required for years to come. The heavier rails naturally required a larger ingot and larger soaking pits to accommodate them. The size of the new ingot is 23½ in. square, and is the largest ingot from which rails are produced in this country today.

The new rail mill, known as No. 2, consists of two stands of rolls in tandem, a blooming mill, a bloom shear, a reheating furnace and the finishing rolls, which consist of four stands of rolls set up in three trains, the first and second roughing rolls being in one train, and the first finishing rolls in another train, while the final finishing rolls are in a third train.

The ingot is cast at the open hearth furnace which has a capacity of 90 to 100 tons per heat. It is stripped of its mold, and placed in a soaking pit where it is left until it is ready to be rolled. It is delivered to the two stands of 48-in. rolls, where it is reduced in size, after passing through the two tandem rolls. It is then returned to its original starting point by means of two turn-tables and a return runway, and passes a second time through two different passes in the tandem rolls, which makes sufficient reduction to enable the 40-in. three-high blooming mill, to which it is delivered, to reduce it in size by seven passes, to a bloom about 10 in. square. This bloom then passes to a hydraulic shear, where the proper discard is made, and the bloom is cut to convenient lengths for further rolling. The bloom is then charged into a reheating furnace where it is reheated to the proper temperature, and delivered to the rail mill, where it is given 5 passes in the first roughing, 4 in the second roughing, 3 in the first finishing and 1 in the final finishing, after which it passes through the cambering roll, is sawed to length and delivered to the cooling beds. The total number of passes from the ingot to the finished rail amounts to 24.

Special design gag presses have been installed to take care of the heavier rails. Drill presses are so located as to permit of a limited quantity of long rails, about 65 ft. long, to be finished. The loading beds extend the entire length of the mill. After proper inspection the rails are lifted by means of electric magnets operated from traveling overhead cranes, and are placed on cars for shipment. Near the saws is located the drop testing machine, which was erected after the design adopted by the American Railway Engineering Association.

All the rolls are driven by five tandem compound steam engines. The first two sets of 48-in. tandem rolls are driven by a 5,000 hp. engine, the blooming mill by a 3,000 hp. engine, the first and second roughing rolls by a 4,000 hp. engine, and the first finishing stand by a 4,000 hp. engine. The cambering rolls, saws and second finishing stand are driven by a 2,000 hp. engine.

This new mill has been so designed as to make it more flexible than earlier designs of rail mills, in that it can produce other products when it is deemed necessary. The scheme of rolling has been changed in the design of this mill. In the first place, the larger ingot and the slow movement through the tandem 48-in. rolls and the larger fillets allowed, produce a better bloom, which is almost as smooth and free from cracks as a finished merchant bar. In the finishing end where the usual practice has been to keep the axis of the rail either in a horizontal or a vertical position, this mill holds the rail in an inclined position, thereby getting more work on the top of the rail than has heretofore been possible. A rolling recently completed of 130 lb. rails for the Pennsylvania Railroad shows very satisfactory results, and justifies the improved design of rolling.

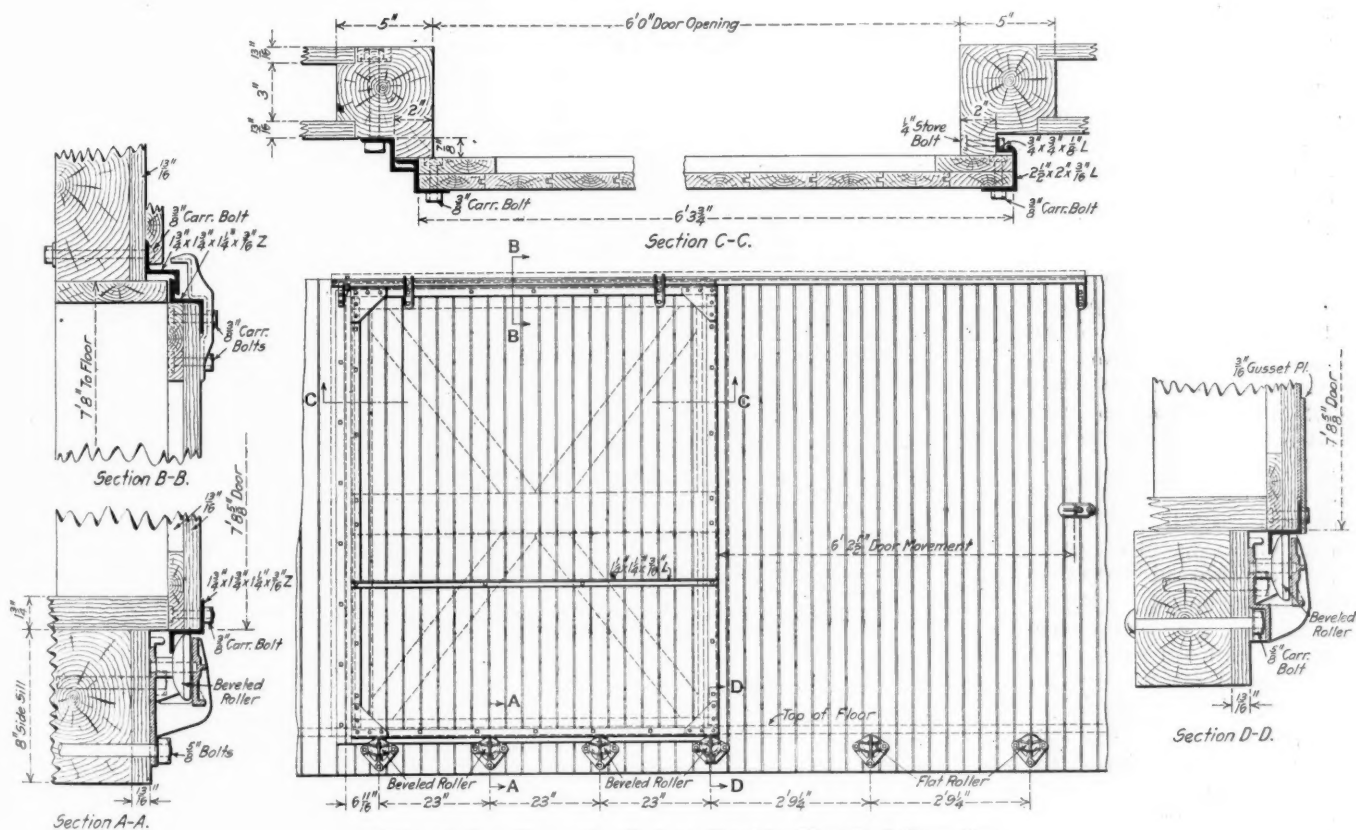
There are many other features which make this mill inter-

but still allowing ample freedom of movement. On steel frame single sheathed box cars the roller brackets are secured with rivets and on double sheathed box cars the roller bracket at the back of the door is so arranged that one of the bolts is concealed, thereby making it inaccessible and thus preventing burglarizing.

The door has a steel frame with gusset plates at the corners and a steel brace extending from the front strip to the back strip. This provides a rigid construction which will keep in alignment and protect the wood, and to which new boards can be applied at any time. The corner gussets prevent the frame strips from loosening or turning out in case the wood deteriorates. The door posts in the case of double sheathed cars project about an inch outside of the sheathing and the flooring at the doorway is carried out flush with the face of the post, the door being made wide enough to lap over the back post. The top and front frame strips are made of Z-bars, having one leg bolted to the door and the other leg extending out from the door and interlocking

expense has been practically negligible and not a door has been reported lost from a car. The illustrations show clearly the construction of this door. It is made by the Union Metal Products Company, Chicago, Ill.

RAILWAY DEVELOPMENT IN VENEZUELA.—According to consular reports, the total railway mileage of Venezuela is 539 miles, including the 5 miles of the Macuto & Coast Line Railway, which is really an electric tramway. The present termini of the Central Railway of Venezuela are Caracas and Yare, the extension of about 5 miles, from Santa Teresa to Yare, having been opened to traffic. The Bolivar Railway worked with regularity during 1915, and the new branch line to San Felipe has been opened to traffic as far as Marin, close to San Felipe. In the Maracaibo district three railways are operating, viz.: The Gran Ferrocarril de Tachira, about 72 miles in length, which runs from Encontrados on the river Catatumbo to Tachira, and from that town there



National Car Door Applied to Double Sheathed Box Car

with Z-bars or other suitable members on the car. The bottom frame strip is also of Z-bar section, one leg being bolted to the door and the other extending down and behind the rollers described above. The back frame strip is an angle with one leg bolted to the door and the other, slightly longer than the thickness of the door, bent inward to close over the leg of a small angle secured to the back door post. This construction makes the door weather proof and spark proof. The interlocking of the door at all sides also prevents it from being sprung open by thieves when once it is closed.

Safety hangers are provided to carry the door on the door hood in the event the car to which it is applied is side-wiped and the bottom roller brackets knocked off. In such a case the door would still be operative. Safety door stops are also provided in case the ordinary back stop is knocked off. These are extra precautions taken to prevent the loss of the door from the car. From reports of 1,000 cars, on which these doors have been in service for one year, the maintenance

is a good road to San Cristobal; the Gran Ferrocarril de La Ceiba, which starts from La Ceiba and runs for some 58 miles into the interior of the State of Trujillo; and the Santa Barbara Railway, which starts from Santa Barbara on the river Escalante, and runs about 50 miles into the state of Merida.

SERBIANS ON FRENCH RAILWAYS.—A number of Serbian railway men are now working at various railway centers in France. Altogether, the Paris-Orleans and the Paris, Lyons and Mediterranean companies have 500 of these men.

NEW RUSSIAN RAILWAY.—The Russian Government has decided to begin in January, 1917, the construction of a railway from Alexandrovgai—the terminus of a branch line of the Rjasan-Urask Railway to Tchardchui, a distance of approximately 1,100 miles, on the Merv-Buchara line, in Buchara. Thence the railway will be continued to Kerki, on the frontier of Afghanistan, and also to Kungari.

WILLIAM J. CUNNINGHAM

W. J. Cunningham, president's assistant of the Boston & Maine, has been appointed to the James J. Hill Professorship of Transportation of Harvard University. This professorship was established to commemorate the work of the late James J. Hill. Howard Elliott, president of the New York, New Haven & Hartford, and Thomas W. Lamont, perhaps, did more to secure the establishment of the James J. Hill professorship than any others, but the list of donors to the gift of \$125,000 which establishes the professorship is a long one.

The appointment of William J. Cunningham shows a recognition of the really great possibilities that are in the professorship. There are very few men in the United States who combine a thorough practical knowledge of railroad operation with the scholarly qualities necessary to make a professorship at Harvard University of as far reaching influence and importance as it can be made. Mr. Cunningham is one of these few men.

Railroad operation and management have many points in common with a profession, yet insofar as the opportunities of learning the business are concerned, it is more in the nature of a trade or business. Experience has been almost the only school open to the student. There have been exceptions, of course. The work done by men like Professor Ripley of Harvard and Professor Adams of Michigan has been of great usefulness. To a certain extent, however, there has been lacking on the part of those who are engaged as student teachers of railroad management, a thorough first-hand knowledge of the problems of railroad operation. It is in the operating department that the young man entering railroad service has had to feel his way by experience. It is by the results of operation of railroads that the public knows them, but of the operations themselves the public knows nothing. It is of the utmost importance

therefore that so important and influential a position as the James J. Hill Professorship of Transportation should be filled by a man who understands the actual practical problems involved in railroad operation and management and who at the same time has that broader scholarship which is essential in such a position.

William J. Cunningham was born April 29, 1875, at St. John, N. B. He began railway work in 1892 with the Canadian Pacific as stenographer and ticket clerk in the passenger department at St. John, N. B., and Boston, Mass. In 1896 he went to the Boston & Albany as clerk in the superintendent's office at Boston, and three years later became statistical clerk to the general manager of the New York, New Haven & Hartford. From 1901 to 1907 he was employed in various capacities by the Delaware, Lackawanna & Western, his last position being assistant chief clerk to the general superintendent. In November, 1907, he became associated with J. H. Hustis (then assistant general manager of the Boston & Albany) as statistician. When the Harvard Business School was established in 1908, Mr. Cunningham

was engaged for two years as lecturer on railroad operation. In September, 1910, he was appointed assistant professor of transportation, but continued to act on Mr. Hustis' staff as consulting statistician. Coincident with the election of Mr. Hustis as vice-president of the New York, New Haven & Hartford, Prof. Cunningham was appointed vice-president's assistant, with headquarters at New Haven, Conn. To permit of the acceptance of this appointment for two years Harvard University granted partial leave of absence for that time, and Prof. Cunningham continued to lecture at Harvard on one day a week.

During the summer of 1910 Prof. Cunningham made a special study of British railways, and the following summer did work of a similar nature on the Harriman Lines with special reference to the unit system, and also on the Santa Fe and the Frisco lines. In the summer of 1912 he made a study of the Prussian-Hessian railways, and during the summer of 1913 he was engaged on special work for Vice-

President Seger of the Union Pacific system. Shortly after Mr. Hustis had been elected president of the Boston & Maine, Mr. Cunningham was appointed president's assistant.



W. J. Cunningham

STEEL RAILS IN GERMANY.—The Prussian State Railway Department recently revised its contract with the Steel Union in regard to the state requirements of rails, ties and accessories. The former arrangement, which held good for another year, has been superseded by a new agreement for three years, the price for rails having been raised 15 marks per ton and is now standing at 129 marks per ton. This increase in the price is considered moderate, since the price for other products of the Steel Union has been raised as much as 50 per cent. At the same time it means an extra 15 per cent to the Steel Union on the deliveries during the first year. but the railway department is probably of opinion that

the present time is more favorable for making a forward contract than will be the earlier portion of 1917, when a fresh agreement in any case would have to be entered upon. If the war were still going on at that time, an advance of 15 marks would in all probability be declined as insufficient by the Steel Union, and even if, in the meantime, peace had been concluded, it is doubtful whether the quotations for steel and iron products would all at once descend to normal figures. A too sudden fall in the general level of industrial quotations is likely to be averted by the amount of repair work which will have to be taken in hand. The state railways are holding back all work that is not particularly urgent, and the steel and iron works are by no means keen about the manufacture of rails at a nominal profit, when it pays them much better to push the manufacture of half-finished products. This is evidenced by the aggregate of railway materials (rails, etc.), which in the year 1914-15 only amounted to 1,759,115 tons, as compared with a total of 2,748,728 tons during the preceding year.—*Engineering, London.*

General News Department

The Transportation Club of Ft. Worth, Tex., has been organized and temporary officers have been chosen.

A fire in the yards of the Pere Marquette, at Detroit, Mich., September 21, destroyed 52 loaded freight cars. In a fire on the 20th at Wellsboro, Ind., 32 carloads of wheat were destroyed.

On the Panama Railroad, according to an order which went into effect September 1, the working day for trainmen and for the crews of switching engines is eight hours, except in cases of emergency.

Near Baltimore, Md., about 400 Mexicans are at work as track laborers on the Pennsylvania; and from Laredo, Tex., it is reported that the Pennsylvania is hiring Mexicans, as fast as it can, at the rate of \$1.80 a day with transportation to the places where they are to be put to work. Many of these men have families, which, it is said, they are taking with them.

Eastbound passenger train No. 14 of the Michigan Central, known as the New York Express, was stopped by robbers near Dearborn, ten miles west of Detroit on the night of September 27, and the mail was robbed. After stopping the train by disarranging the block system, the men uncoupled the mail and baggage cars from the rest of the train and moved them forward two miles. There they ransacked both cars and escaped after extinguishing the fire in the locomotive.

It is reported on good authority that the shopmen on eighteen western railways have voted to strike if not granted an increase of pay of three cents an hour and an eight-hour day. The vote, however, must be submitted to the executive boards of five international unions for approval. The trades involved are the machinists, boilermakers, blacksmiths, sheetmetal workers and "car men." The demands of 1,000 members of the Switchmen's Union of America for an eight-hour day, with an increase from forty-seven cents to fifty cents an hour, and time and one-half for overtime, will go to arbitration, according to an agreement entered into at New York, September 26.

No new developments have taken place in the negotiations between the shopmen and the western railways, except on the Texas & Pacific, where the company's offer of increases in wages ranging from 1½ cents to 2½ cents an hour with a nine-hour day has been accepted by all the crafts except the carmen. The carmen have withdrawn their demands for an eight-hour day, and are expected to make a contract on the same basis. The original request of the men of this road was for an increase of 3 cents an hour in pay and an eight-hour day.

The Lehigh Valley road, inconvenienced by the scarcity of vessels available for the transportation of ties from the South, and the high rates charged, lately used in that traffic its own sea-going tug "Perth Amboy," which ordinarily takes coal to New England. The tug was sent south with three steel barges used for carrying coal. These barges were placed at Brunswick, Ga., and Jacksonville, Fla., where the ties are easily concentrated; and a load of 50,000 ties was quickly obtained. The tug experienced no difficulty in bringing the tow back to Perth Amboy (New York harbor). The experiment is regarded as a complete success. Not only was the company able to bring a large quantity of ties to its line promptly, but there was also a large saving in cost.

A New Kind of Train Robbery

A single-handed, gunless, mid-day train robbery, that netted \$148 from two passengers and no telling how much more from five other victims was executed on the Canadian Pacific train from Toronto at the Black Rock end of the International bridge at 12:20 o'clock yesterday afternoon. The weapons of the bold hold-up man were a harmless pad and pencil, rapid action, a little impersonation work, and the war in Europe.

When the train was stopped at this end of the International bridge for the customs officers to pass through it, a broad-

shouldered man in a dirty gray suit, whose eyes were a bit blood-shot and who appeared to be about thirty years old, entered one of the coaches. Stopping before Mrs. Jessie M. Ardill, he asked in a gruff voice where she was going, to see her ticket and after examining it, wanted to know how much money she had.

Mrs. Ardill took a roll of bills from her bag and handed it to the man. He counted the money, took \$110 and returned \$65 to her, adding that he would have to take the money as a deposit. He gave her a left-handed receipt showing that her \$110 had been paid over to "the United States Customs at Buffalo." Mrs. Ardill thanked the man and placed the receipt in her pocketbook.

The next victim, further down the aisle was Edward Crockett of Brantford, Ont. "How much money have you to get into this country?" Crockett was asked. He obliged the man by handing over his wallet. The artist in crime counted \$50 took \$38 and gave Crockett a receipt.

At this juncture Mrs. Ardill looked questioningly towards the man who returned to her. She said, "I'm going to New York. Do I stay in this coach?" He blandly replied, "When we get through the customs here, you move into the coach ahead. There's plenty of time."

The man in the dirty gray suit leisurely walked into the next coach in the rear and by working rapidly wrote out five more receipts.

After the train had left the bridge and had proceeded as far as Forest avenue Conductor Ferguson met Mrs. Ardill hurrying towards the coach ahead. "Stay in this coach," said the conductor; and then revelations and explanations followed.

The train was stopped and the police notified. The names and the amounts taken from the five victims in the second coach were not obtained. The man with the pad and the pencil failed to leave a note showing where he left the train and where he was going. An extra guard has been stationed at the bridge.—*Buffalo Commercial*, Sept. 13.

Railway Men's Pay in England

According to press dispatches, the general demand of the employees of the railways of Great Britain for an increase in pay has been compromised by the granting of a war bonus twice as great as that heretofore allowed; which is equivalent to giving the men half of the ten shillings a week which they had asked for.

Russian Railway Concessions

According to a recent announcement from Petrograd, the Russian Minister of Ways and Communications has decided on the creation of a new type of railway company. Henceforth, the Government will only accord concessions for new lines to companies whose shareholders are interested in the development of the districts to be traversed. In other words, the shareholders must be business men, industrialists or agriculturists in direct local interests. The Zemstvos, or district councils, will be empowered to make long-term loans to the companies, and the Government, in certain cases, will also accord subsidies. The Finance Minister has agreed to establish a special fund for the purpose, so that the local authorities referred to will be enabled to borrow money on easy terms in order to participate in the construction of new railways. The object of this scheme is to insure that no new lines shall be built save under conditions that will alike serve the interests of the localities concerned and of the Government. It will also prevent "peaceful penetration" in the shape of control or ownership of Russian railways by German shareholders or financial concerns.—*Railway Gazette*.

TWINE FOR THE POSTAL SERVICE.—Twine enough to encircle the earth twenty-seven times, or 680,000 miles of cord weighing 2,000,000 pounds, will be used by the United States postal service next year in tying up mail matter.

Chief Interchange Car Inspectors' and Car Foremen's Association

The Chief Interchange Car Inspectors' and Car Foremen's Association will hold its annual convention at Indianapolis, Ind., October 3, 4 and 5, 1916. In addition to a very thorough discussion of the Master Car Builders' Rules and the changes made therein at the June convention for the purpose of arriving at a uniform interpretation and thereby accelerating the movement of cars through the various interchange points throughout the country, it is anticipated that papers will be read dealing with a number of car department subjects. At this convention will also be decided the winners of the \$25, \$15 and \$10 prizes offered for the three best papers on Car Department Apprenticeship. Committees have been appointed to report on Freight Car Maintenance and Advanced Methods of Freight Car Repair Billing, and several papers on these subjects will be read. Papers will also be read on the subjects of Interchange Inspection and Passenger Car Cleaning and Sanitation.

The association now has a membership of about 500 general foremen, car foremen and interchange inspectors throughout the country and it is anticipated that the constitution and by-laws will be amended so as to admit to membership car inspectors, M. C. B. bill clerks, or anyone actively engaged in the work of the car department.

American Electric Railway Association

The annual convention of the American Electric Railway Association will be held at Young's Million Dollar Pier, Atlantic City, N. J., beginning Monday, October 9, and continuing through Friday, October 13. Among the reports to be presented which are of interest to the readers of the *Railway Age Gazette*, are the following: From the committee on heavy electric traction, E. R. Hill, chairman; committee on power distribution, C. L. Cable, chairman; committee on roadway, C. H. Clark, chairman; and committee on equipment, W. G. Gove, chairman.

On the opening day there will be an address on electric railways and preparedness by Major General Leonard Wood. One of the speakers scheduled for Wednesday is Ivy L. Lee, who will speak on publicity. Other speakers named in the five-days program are: W. J. Harvie, overhead and underground line construction; J. N. Shannahan, valuation; A. W. Brady, federal relations; H. S. Lyons, payment for carrying mails; Calvert Townley, electrolysis; C. L. Allen, public relations; B. I. Budd, operation of motor vehicles.

Track Supply Exhibit

In addition to the firms mentioned in the issue of last week as exhibiting at the convention of the Roadmasters and Maintenance of Way Association in New York on September 19-22, the following firms retained membership in the Track Supply Association but did not present exhibits:

Ajax Forge Co., Chicago, Ill.
 Elliot Frog & Switch Co., East St. Louis, Ill.
 Morden Frog & Crossing Works, Chicago, Ill.
 Cleveland Frog & Crossing Co., Cleveland, Ohio.
 L. S. Brach Supply Co., Newark, N. J.
 H. M. Brown.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, New Orleans, La.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, Washington, D. C.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, Gruenwald Hotel, New Orleans, La.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Annual convention, October 3-5, Indianapolis, Ind.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.
- RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.
- RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala. Annual meeting, October 3-5, Hotel Astor, New York.
- RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 11-13, Hotel Sherman, Chicago.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, Hotel McAlpin, New York.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Hotel Raleigh, Washington, D. C.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.
- TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.
- TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Annual convention, October 24-27, Hotel Sherman, Chicago.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.
- WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1916

Name of road.	Average mileage operated during period.	Operating revenues.			Maintenance of Way and structures.		Operating expenses.			Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.		
		Freight.	Passenger.	Total (inc. misc.).	Equip-structures.	Traffic.	Trans- portation.	Miscel- laneous.	General.					Total.	
Chicago, Burlington & Quincy.....	9,369	\$5,532,318	\$1,896,518	\$8,283,114	\$1,366,041	\$1,528,392	\$205,155	\$2,448,938	\$74,912	\$184,303	\$5,401,897	\$2,881,218	\$426,305	\$2,445,365	\$746,558
Chicago, Indianapolis & Louisville.....	622	454,840	163,015	669,609	75,434	133,796	20,835	189,110	1,028	19,476	438,880	230,730	36,613	194,088	40,929
Chicago, Terre Haute & Southeastern.....	373	182,324	14,688	202,321	23,411	14,298	3,844	57,039	948	10,023	109,569	72,752	13,383	179,365	13,333
Cripple Creek & Colorado Springs.....	87	102,223	14,912	119,934	4,946	18,515	2,898	22,027	.....	3,211	51,596	68,338	299,151	60,736	10,771
Philadelphia & Reading.....	1,127	3,922,065	636,538	4,844,151	356,334	683,646	57,534	1,579,205	12,034	87,776	2,773,551	2,070,601	22,499,699	1,770,712	322,159
TWELVE MONTHS OF FISCAL YEAR, 1916															
Chicago, Burlington & Quincy.....	9,368	\$71,592,578	\$21,168,055	\$102,358,893	\$12,014,208	\$15,592,110	\$1,610,627	\$29,956,781	\$927,593	\$2,017,687	\$61,713,161	\$40,645,732	\$4,449,291	\$36,186,894	\$9,608,865
Chicago, Indianapolis & Louisville.....	622	5,245,941	1,884,184	7,694,734	838,061	1,279,091	239,099	2,538,474	4,463	18,064	5,111,039	2,583,690	364,214	2,217,286	654,653
Chicago, Terre Haute & Southeastern.....	373	2,270,165	193,825	2,528,047	357,695	154,327	47,569	746,851	12,080	103,465	1,812,787	715,260	133,900	581,074	142,129
Cripple Creek & Colorado Springs.....	87	1,155,323	233,061	1,412,536	154,740	163,083	41,368	332,361	40,703	732,255	732,255	680,282	69,289	610,992	81,000
Philadelphia & Reading.....	1,127	47,581,867	6,793,606	57,298,393	4,019,699	8,829,296	574,003	18,898,268	152,901	938,051	33,389,656	23,908,733	1,402,177	22,499,699	8,082,851

TWELVE MONTHS OF FISCAL YEAR, 1916

Chicago, Burlington & Quincy.....	9,368	\$71,592,578	\$21,168,053	\$102,358,893	\$12,014,208	\$15,592,110	\$1,610,627	\$29,956,781	\$927,593	\$2,017,687	\$61,713,161	\$40,645,732	\$4,449,291	\$36,186,894	\$9,608,865
Chicago, Indianapolis & Louisville.....	622	5,245,941	1,854,184	7,094,724	838,061	1,279,091	239,099	2,538,474	4,463	218,064	5,111,039	2,583,694	364,214	2,217,286	654,653
Chicago, Terre Haute & Southeastern.....	373	2,270,165	193,825	2,528,047	357,695	147,327	47,569	746,851	12,080	103,465	1,812,787	715,260	13,900	581,074	142,129
Cripple Creek & Colorado Springs.....	87	1,155,323	233,061	1,412,536	154,740	163,083	41,368	332,361	.....	40,703	732,255	680,282	69,289	610,992	.....
Philadelphia & Reading.....	1,127	47,581,867	6,793,606	57,298,393	4,019,699	8,829,256	574,003	18,898,268	152,901	938,051	33,389,659	23,908,734	1,402,177	22,499,699	8,082,851

MONTH OF JULY, 1916

Alabama & Vicksburg.....	143	\$86,134	\$28,290	\$140,825	\$16,555	\$32,714	\$3,996	\$48,040	\$2,225	\$6,130	\$109,661	\$31,164	\$8,600	\$122,564	\$11,543
Alabama Great Southern.....	309	282,534	124,786	448,070	48,144	105,602	13,531	136,115	2,928	11,740	318,060	130,010	17,064	112,900	4,321
Ann Arbor.....	294	168,888	55,296	238,380	21,068	34,477	4,980	91,247	888	8,561	161,221	77,158	13,400	63,760	23,378
Arizona Eastern.....	378	300,125	43,275	362,344	36,619	32,872	2,287	68,340	2,063	12,152	154,101	208,243	16,200	192,042	74,867
Atchison, Topeka & Santa Fe.....	8,648	6,668,065	2,602,905	10,015,642	1,253,245	1,549,064	186,662	2,662,661	752	193,608	5,831,658	4,183,984	443,023	3,739,446	742,327
Atlanta & West Point.....	93	50,287	42,144	125,741	12,874	20,097	6,391	30,894	1,848	4,832	76,935	28,806	6,564	22,228	10,574
Atlanta, Birmingham & Atlantic.....	640	179,762	52,523	252,977	40,598	48,688	14,121	94,458	26	8,973	206,864	46,114	13,100	32,997	.....
Atlantic Coast Line.....	167	120,005	34,021	164,450	28,746	37,676	4,339	93,001	.....	5,165	168,928	4,478	9,895	14,373	.....
Atlantic Coast Line.....	4,735	1,751,754	666,173	2,607,180	380,287	504,582	57,676	956,482	9,013	81,278	1,987,397	619,784	160,000	457,236	13,718
Baltimore & Ohio.....	4,539	7,663,003	1,642,603	10,153,913	1,239,921	1,990,611	195,842	3,347,023	92,817	200,810	7,066,864	3,087,049	338,296	2,744,423	41,115
Baltimore & Ohio Chicago Terminal.....	79	100,681	52,171	159,597	17,606	22,259	933	69,907	2,370	5,181	116,838	30,930	22,689	8,242	7,744
Baltimore, Chesapeake & Atlantic.....	88	100,681	52,171	159,597	17,606	22,259	933	69,907	2,370	5,181	116,838	30,930	22,689	8,242	7,744
Bangor & Aroostook.....	632	140,652	52,381	211,051	47,191	51,262	2,849	71,680	3,229	13,117	187,908	23,143	2,300	40,080	6,287
Belt Ry. Co. of Chicago.....	31	1,000,000	.....	1,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bessemer & Lake Erie.....	205	1,235,426	39,889	1,292,958	85,302	173,584	12,013	283,403	.....	13,108	547,903	745,055	22,010	723,035	40,327
Bingham & Garfield.....	36	277,575	2,942	282,879	17,890	23,935	851	31,856	59	3,061	77,650	205,229	9,961	195,268	90,294
Boston & Maine.....	2,298	2,600,016	1,613,438	4,219,795	545,591	568,933	36,715	1,851,001	24,949	97,843	3,124,985	1,594,810	172,252	1,422,558	342,125
Buffalo & Susquehanna R. Corp.....	234	133,572	6,323	142,288	20,925	32,138	1,283	38,774	.....	5,994	98,513	43,775	2,600	41,174	2,902
Canadian Pacific Lines in Maine.....	234	52,555	16,847	79,677	23,708	12,698	5,646	32,792	.....	4,028	78,872	765	9,100	8,335	9,702
Carolina, Clinchfield & Ohio.....	283	149,969	21,409	180,668	17,524	29,321	14,459	41,155	.....	11,295	113,431	67,237	14,250	52,987	31,891
Central of Georgia.....	18	5,999	876	7,252	351	92	1,963	2,228	.....	579	5,208	2,043	750	1,276	1,036
Central of New Jersey.....	1,924	704,927	307,825	1,119,170	175,308	198,532	42,652	349,027	898	41,100	805,526	313,644	54,558	258,580	60,333
Central New England.....	684	1,972,017	773,142	2,662,757	336,073	456,831	34,554	595,681	15,476	82,906	1,821,509	1,141,248	19,914	1,001,326	280,612
Central Vermont.....	301	411,998	51,151	486,046	42,315	51,365	992	121,581	.....	5,486	221,736	264,310	15,000	249,310	81,513
Charleston & Western Carolina.....	411	229,559	94,014	361,552	42,760	58,908	9,268	163,714	2,692	9,132	286,474	75,078	15,565	59,504	1,543
Chesapeake & Ohio Lines.....	343	88,991	29,017	128,169	28,584	25,847	4,397	45,157	.....	4,061	107,880	20,289	5,000	15,289	6,267
Chicago & Alton.....	2,386	3,060,562	624,982	3,972,154	465,405	759,933	54,629	1,096,782	30,761	84,207	2,489,347	1,482,806	127,420	1,355,359	213,255
Chicago & Eastern Illinois.....	1,053	970,105	405,886	1,485,433	162,890	301,766	36,936	469,496	10,997	32,498	1,014,533	470,880	46,112	424,435	218,371
Chicago & Erie.....	1,136	897,790	284,477	1,292,036	235,111	294,061	24,963	449,625	7,607	40,201	1,048,212	243,824	62,400	181,360	50,040
Chicago & Erie.....	270	532,674	81,537	668,387	70,118	70,022	18,778	249,556	1,887	15,874	433,269	245,118	22,230	222,888	79,925
Chicago & North Western.....	8,108	4,973,604	2,177,458	8,085,920	1,147,240	1,193,998	121,481	2,731,824	61,081	164,198	5,365,838	2,720,082	410,000	2,309,791	822,968
Chicago, Burlington & Quincy.....	9,369	5,370,972	2,124,801	8,278,336	1,086,494	1,454,377	151,758	2,400,525	81,334	198,514	5,373,002	2,905,334	381,036	2,524,298	564,027
Chicago, Detroit & Can. Grand Trk. Jctn.....	60	55,483	18,122	89,985	10,933	8,350	1,399	38,558	.....	1,556	60,796	29,189	3,487	25,701	167
Chicago, Great Western.....	1,496	820,231	338,467	1,276,642	204,712	199,266	47,078	416,453	9,280	37,790	912,966	363,676	45,744	317,075	122,961
Chicago, Indianapolis & Louisville.....	622	462,958	166,300	680,553	71,057	111,210	19,540	220,370	455	16,262	436,546	244,007	29,438	214,559	71,820
Chicago Junction.....	13	944,049	516,206	1,596,854	192,281	228,458	32,417	543,915	16,636	42,801	1,034,340	542,511	85,744	456,351	133,335
Chicago, Milwaukee & St. Paul.....	10,208	6,340,022	2,003,608	9,063,387	1,063,617	1,205,357	175,150	3,015,247	73,071	161,501	5,566,884	3,669,504	480,190	3,188,436	377,897
Chicago, Peoria & St. Louis.....	255	111,002	29,078	148,595	19,613	36,308	5,450	57,764	.....	6,030	125,430	23,430	6,000	17,430	15,210
Chicago, Rock Island & Gulf.....	477	192,074	62,086	272,595	48,004	33,242	9,721	89,540	1,060	8,909	190,477	82,119	10,000	72,048	47,902
Chicago, Rock Island & Pacific.....	7,548	3,911,119	1,986,945	6,381,385	918,235	1,098,068	139,169	2,138,899	48,553	155,335	4,506,248	1,875,137	293,040	1,582,279	948,157
Chicago, St. Paul, Minn. & Omaha.....	1,753	944,049	516,206	1,596,854	192,281	228,458	32,417	543,915	16,636	42,801	1,034,340	542,511	85,744	456,351	133,335
Chicago, Terre Haute & Southeastern.....	373	189,057	16,347	205,404	29,803	50,965	3,753	60,448	1,002	8,449	154,420	56,500	10,883	45,616	20,328
Cincinnati, Hamilton & Dayton.....	622	704,832	121,326	933,891	149,669	118,961	14,747	315,156	3,334	18,170	618,964	314,927	28,280	286,634	67,038
Cincinnati, Indianapolis & Western.....	322	137,751	48,121	202,529	31,233	27,711	7,759	75,064	440	6,611	148,604	53,925	9,441	44,484	.....
Cincinnati, New Orleans & Texas Pacific.....	337	670,574	177,171	906,470	73,906	212,282	27,688	252,359	6,270	19,051	591,556	314,914	32,000	282,845	66,762
Cincinnati Northern.....	246	134,606	20,642	161,749	26,248	31,315	48,909	27,264	2,722	7,478	108,458	53,491	6,000	47,290	18,197
Cleveland, Cincinnati, Chic. & St. Louis.....	2,384	2,516,123	997,673	3,841,219	445,808	741,451	93,477	1,228,029	26,406	74,778	2,602,325	1,238,893	149,000	1,089,219	339,133
Coal & Coke.....	197	74,569	18,299	96,369	19,948	23,349	999	26,990	.....	3,074	74,360	22,009	5,000	17,009	3,941

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Railway tax accruals.	Operating income (or decr.) (or loss).	Increase (or decr.) comp. with last year.				
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Maintenance of equipment.	Traffic.					Transportation.	Miscellaneous.	General.	Total.
Colorado-Midland.....	338	\$89,180	\$26,718	\$127,642	\$32,260	\$27,715	\$7,615	\$53,672	\$1,874	\$5,382	\$128,519	—\$9,876	\$9,000	—\$9,876	\$8,844
Colorado & Southern.....	1,102	474,294	175,638	701,431	98,008	137,601	11,071	196,721	4,765	20,612	468,777	232,653	38,500	193,815	81,853
Cripple Creek & Colorado Springs.....	187	86,437	22,199	111,218	9,261	12,064	2,958	26,079	2,973	5,603	37,883	57,883	7,603	50,281	—8,468
Cumberland Valley.....	164	195,968	55,804	267,645	32,965	32,563	4,960	83,504	.....	710	153,049	114,596	5,960	108,634	27,377
Delaware & Hudson Co.—R. R. Dept.....	886	1,829,477	308,910	2,287,311	190,410	462,808	38,232	781,156	22,090	78,776	1,573,471	713,840	58,650	655,190	—120,932
Delaware, Lackawanna & Western.....	955	3,195,815	860,408	4,507,804	525,229	611,842	80,046	1,355,914	39,452	85,830	2,694,401	1,813,403	202,500	1,610,695	703,139
Denver & Rio Grande.....	2,577	1,541,724	404,143	2,096,617	278,928	337,998	42,453	504,135	33,972	51,567	1,284,651	847,966	92,000	755,567	226,485
Denver & Salt Lake.....	255	118,140	51,375	173,223	33,054	32,276	3,008	51,010	.....	5,158	124,507	53,716	8,021	74,495	—4,200
Detroit & Mackinac.....	383	117,090	33,387	105,585	13,653	16,699	2,246	34,289	293	2,523	69,702	35,883	8,126	27,757	12,937
Detroit & Toledo Shore Line.....	81	117,090	.....	117,445	9,242	7,302	1,491	32,946	.....	2,934	157,347	63,529	6,800	56,729	12,937
Detroit, Grand Haven & Milwaukee.....	191	174,000	68,000	289,119	31,533	34,171	4,812	132,195	1,131	4,868	208,710	80,409	3,963	76,154	—9,348
Detroit, Toledo & Ironton.....	441	153,161	186,205	339,366	20,411	28,023	3,968	180,495	.....	5,693	188,589	47,616	6,000	41,558	21,570
Duluth & Iron Range.....	277	93,320	22,470	115,790	76,300	75,637	1,472	196,499	2,225	11,496	360,679	67,451	56,146	618,305	112,225
Duluth, Missabe & Northern.....	411	1,753,202	34,846	1,898,170	133,279	101,547	2,823	278,840	1,186	11,474	529,149	1,369,021	101,347	1,267,674	315,975
Duluth, South Shore & Atlantic.....	601	207,562	104,034	345,608	60,298	34,651	7,277	108,813	4,531	9,251	224,821	120,786	19,000	101,784	23,919
El Paso & Southwestern Co.....	1,028	770,905	217,623	1,040,083	110,361	116,718	17,841	237,286	6,668	25,414	514,288	525,795	39,529	486,258	235,315
Elgin, Joliet & Eastern.....	798	1,045,774	20	1,113,066	98,438	271,540	6,119	309,749	.....	22,784	708,294	404,772	36,517	368,255	13,821
Florida East Coast.....	1,989	4,027,461	1,024,124	5,637,827	529,360	1,119,094	92,607	2,012,924	42,194	135,347	3,929,372	1,708,453	194,147	1,513,823	—301,955
Fort Worth & Denver City.....	745	349,321	110,753	506,905	55,891	77,985	7,705	159,984	2,971	15,376	318,242	188,663	26,032	162,631	110,880
Fort Worth & Denver City.....	454	305,497	137,188	467,489	59,090	88,826	9,443	126,132	2,787	18,979	305,258	162,231	15,500	146,731	65,917
Galveston, Harrisburg & San Antonio.....	1,361	315,395	315,292	1,187,230	161,404	163,347	30,357	397,104	9,558	38,815	795,288	391,942	48,502	342,931	178,457
Galveston, Wharf.....	14	.....	.....	0,017	1,249	2,325	3,857	23,754	17,565	368	45,846	24,171	10,300	13,871	—19,675
Georgia.....	307	191,717	69,616	280,989	22,218	41,237	14,353	71,060	142	8,758	184,221	96,767	4,865	91,899	53,239
Georgia, Southern & Florida.....	395	105,712	60,288	187,909	25,035	40,008	7,796	71,060	.....	8,685	152,576	35,333	11,115	24,077	8,735
Grand Canyon.....	64	1,446	27,388	34,785	9,455	974	53	10,644	.....	169	21,295	13,490	1,506	11,984	—116,582
Grand Rapids & Indiana.....	575	269,419	182,559	500,534	61,059	80,285	10,924	198,932	3,397	17,051	371,648	128,886	24,081	104,797	—1,162
Grand Trunk Western.....	347	624,000	168,000	831,260	103,489	136,033	15,141	244,207	7,648	13,616	480,134	351,126	36,637	313,985	146,319
Great Northern.....	8,051	5,321,739	1,569,942	7,619,246	1,024,277	2,329,360	105,903	1,943,570	89,640	115,788	4,065,876	3,553,370	464,973	3,087,988	721,875
Gulf & Ship Island.....	308	116,463	30,784	156,178	16,409	28,078	4,145	52,924	271	7,217	109,044	47,134	7,340	39,778	—3,219
Gulf, Colorado & Santa Fe.....	1,958	855,050	287,882	1,216,121	256,232	192,799	28,783	462,573	.....	45,356	730,508	273,398	27,000	170,966	—100,710
Hocking Valley.....	350	625,823	89,927	780,565	77,130	176,065	7,921	209,018	.....	13,739	483,873	296,692	41,350	255,335	67,670
Houston, East & West Texas.....	191	83,352	31,837	123,534	24,092	18,565	2,236	39,357	864	3,242	88,292	35,235	3,360	29,737	10,385
Houston & Texas Central.....	925	412,976	180,129	632,786	85,176	91,497	15,829	196,728	4,570	17,842	410,792	221,594	33,065	191,131	73,518
Illinois Central.....	4,767	3,998,556	1,272,036	5,842,492	901,245	1,560,411	109,904	1,746,937	34,136	160,142	4,500,579	1,949,913	318,000	1,022,661	491,364
Indiana Harbor Belt.....	109	.....	.....	360,376	51,670	40,592	2,881	127,865	.....	7,763	230,770	129,606	6,453	123,093	48,947
International & Great Northern.....	1,160	529,521	255,196	854,971	126,501	160,929	21,902	299,825	5,229	28,298	629,747	225,224	30,000	195,169	172,073
Kanawha & Michigan.....	177	239,594	35,950	285,641	44,381	72,839	3,580	73,418	4	6,667	201,219	82,423	14,000	68,422	—22,367
Kansas City, Mexico & Orient.....	272	86,305	13,892	107,845	21,448	20,905	3,578	35,511	.....	3,823	89,484	18,361	6,000	12,328	10,446
Kansas City Southern.....	837	699,367	165,307	947,581	84,855	122,301	25,874	268,677	.....	34,859	534,964	413,485	48,083	364,793	44,215
Lake Erie & Western.....	900	527,617	76,614	644,407	61,660	95,572	12,457	188,815	.....	12,005	370,508	273,898	27,000	246,780	157,127
Lehigh & Hudson River.....	97	170,575	13,531	201,944	22,591	34,080	1,533	63,674	.....	4,195	126,074	75,870	5,000	70,825	20,697
Lehigh & New England.....	296	201,957	39,282	237,755	32,746	32,570	2,627	46,362	.....	5,679	144,754	73,020	8,820	64,178	—103,510
Lehigh Valley.....	1,444	3,482,311	525,345	4,307,498	556,155	634,422	84,068	1,512,320	16,611	87,372	2,936,450	1,371,047	148,500	1,222,323	193,779
Long Island.....	397	335,837	1,137,365	1,680,637	152,622	138,529	23,250	316,822	6,377	32,922	866,890	813,788	71,905	741,735	74,320
Louisiana & Arkansas.....	279	109,495	19,000	132,904	24,435	17,921	3,503	34,853	.....	4,265	84,997	47,907	7,920	39,971	6,620
Louisiana Rv. & Navigation Co.....	351	126,548	26,615	163,644	28,480	19,762	6,686	52,989	.....	6,397	114,314	49,330	11,000	38,325	2,627
Louisiana Valley.....	208	114,383	60,432	187,881	28,481	28,718	7,181	47,154	1,703	6,648	115,162	72,719	10,250	62,424	18,491
Louisville & Nashville.....	5,071	3,646,353	1,120,338	5,102,985	728,374	959,041	118,931	1,530,360	18,827	114,505	3,470,745	1,631,860	198,639	1,432,362	249,911
Louisville, Henderson & St. Louis.....	200	87,643	40,856	136,383	23,314	15,861	5,184	30,428	.....	2,843	87,541	48,843	3,800	45,044	37,879
Maine Central.....	1,221	608,895	387,537	1,044,597	144,594	171,711	17,171	394,761	10,894	28,611	730,587	353,950	49,602	304,310	58,504
Michigan Central.....	1,803	2,432,871	1,180,590	3,887,971	518,397	536,856	69,096	1,269,164	55,462	70,076	2,519,951	1,338,020	140,000	1,196,343	310,440
Midland Valley.....	385	130,419	44,296	180,635	36,736	32,579	2,677	46,362	.....	7,229	125,346	55,289	5,914	49,309	19,723
Mineral Range.....	120	86,707	59,537	237,755	13,440	13,949	3,304	36,962	.....	1,330	26,804	2,874	3,400	23,504	871
Minn., St. Paul & Sault Ste. Marie.....	4,228	2,277,075	683,146	3,201,682	308,484	344,947	47,875	805,311	18,865	64,60					

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1916—CONTINUED

MONTH OF JULY, 1916—CONTINUED																
Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) income with comp. last year.			
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equip. ment.	Traffic.	Trans- portation.	Miscel- laneous.					General.	Total.	
New Orleans & North Eastern.....	204	\$215,552	\$60,383	\$308,962	\$34,314	\$56,342	\$10,148	\$94,889	\$7,060	\$11,978	\$214,732	\$94,229	\$15,700	\$78,529	\$5,925	\$14
New Orleans, Mobile & Chicago.....	402	110,734	26,716	145,704	27,132	20,591	4,227	51,533	2	6,758	110,242	35,462	6,491	28,967	11,621	11,621
New Orleans, Great Northern.....	285	113,014	30,828	150,831	20,313	20,313	4,327	43,022	226	6,675	86,023	62,808	4,485	58,289	15,744	15,744
New Orleans, Texas & Mexico.....	192	59,810	18,236	81,913	16,125	15,218	5,098	22,398	.....	7,329	66,170	13,744	1,347	19,196	1,439,816	1,439,816
New York Central Railroad.....	6,093	11,080,667	5,227,526	18,961,829	1,976,402	3,080,741	346,503	5,840,261	251,775	397,434	11,893,116	7,068,712	768,378	6,299,332	212,260	212,260
New York, Chicago & St. Louis.....	570	1,038,994	190,425	1,283,928	119,847	178,471	45,732	461,251	5,668	24,585	835,217	448,712	42,000	406,710	202,438	202,438
New York, New Haven & Hartford.....	2,005	3,223,716	2,869,266	6,967,345	749,650	856,220	37,779	2,445,464	81,071	164,141	4,334,011	2,633,333	23,000	2,377,194	202,438	202,438
New York, Ontario & Western.....	568	445,961	398,184	842,145	102,721	127,954	7,463	303,128	.....	18,351	558,920	428,527	13,000	405,822	23,568	23,568
New York, Philadelphia & Norfolk.....	112	474,685	53,881	528,566	44,588	49,789	4,780	179,237	5,034	11,441	342,638	219,337	14,100	206,264	42,617	42,617
New York, Susquehanna & Western.....	140	1,173,129	53,881	1,227,010	24,203	33,002	2,017	121,161	.....	9,466	189,849	69,215	14,100	55,113	39,654	39,654
Norfolk & Western.....	2,086	4,070,215	545,507	4,845,121	663,100	850,877	58,922	1,177,656	9,743	85,107	2,823,887	2,021,234	205,000	1,816,107	128,281	128,281
Norfolk Southern.....	908	2,400,772	124,675	3,960,045	62,715	62,331	7,439	1,284,469	146	18,656	279,814	116,231	12,501	103,664	18,716	18,716
Norfolk Pacific.....	6,505	4,610,096	1,489,146	6,323,286	1,057,156	844,184	115,232	1,744,071	102,101	104,444	3,924,943	2,807,343	417,759	2,388,736	970,913	970,913
Northern Pacific.....	507	203,852	282,018	5,629,192	56,629	42,512	6,014	140,473	1,104	9,256	255,184	272,008	18,155	253,853	43,178	43,178
Northwestern Pacific.....	2,247	1,502,326	478,443	2,149,284	307,862	227,897	34,990	449,086	34,569	57,173	1,111,297	1,037,987	123,600	914,249	175,527	175,527
Oregon Short Line.....	670	341,296	81,989	443,444	78,865	70,718	4,245	114,159	.....	11,485	279,413	164,631	11,834	152,197	75,871	75,871
Panhandle & Santa Fe.....	1,755	4,974,341	1,157,412	6,860,076	794,191	1,052,145	96,734	2,104,292	37,691	145,852	4,216,225	2,643,850	292,745	2,350,421	391,518	391,518
Pennsylvania Railroad.....	4,534	13,662,599	4,244,646	19,639,800	2,439,420	3,688,393	214,320	6,191,968	263,908	479,842	13,781,961	5,857,839	683,441	5,172,894	442,602	442,602
Pennsylvania & Potomac.....	19	10,574	4,284	83,606	6,433	12,764	135	41,876	.....	2,792	63,999	19,607	6,500	51,707	9,241	9,241
Peoria & Pekin Union.....	2,249	1,140,279	466,525	1,804,288	180,622	323,054	34,847	590,256	5,724	40,648	1,174,892	629,396	51,041	577,972	199,045	199,045
Pere Marquette.....	717	1,255,713	821,238	2,882,598	278,897	434,282	28,512	854,600	83	54,178	1,649,509	633,089	60,060	572,991	126,998	126,998
Philadelphia, Baltimore & Washington.....	225	1,733,676	199,568	2,064,955	165,519	308,490	13,436	450,142	4,087	32,349	974,023	1,090,933	67,900	1,023,033	181,838	181,838
Pittsburgh & Lake Erie.....	1,489	2,841,006	883,212	4,239,755	569,843	819,473	76,739	1,327,547	27,336	102,133	2,922,332	1,317,423	173,354	1,143,804	342,506	342,506
Pittsburgh, Cincinnati, Chic. & St. Louis.....	294	172,434	9,909	184,926	34,723	61,580	1,582	94,728	.....	7,869	161,845	163,978	10,532	153,433	54,678	54,678
Pittsburgh, Shawmut & Northern.....	28	207,935	84,516	335,823	18,760	34,706	3,849	94,728	.....	1,932	161,845	163,978	10,532	153,433	54,678	54,678
Richmond, Fredericksburg & Potomac.....	468	173,445	118,825	304,335	41,419	55,436	11,371	112,715	1,109	6,531	228,583	111,752	17,203	94,550	17,151	17,151
Rutland.....	258	137,457	27,475	177,760	26,706	22,400	4,397	51,047	402	5,072	110,025	67,735	7,955	59,743	59,743	59,743
St. Joseph & Grand Island.....	4,752	2,770,521	1,213,549	4,243,240	603,207	1,109,453	72,637	1,279,640	.....	116,477	3,447,425	1,095,817	173,656	920,893	27,039	27,039
St. Louis & San Francisco.....	548	216,490	260,636	477,096	65,295	493,226	9,379	131,548	.....	10,219	263,025	230,202	8,000	221,775	179,305	179,305
St. Louis, Brownsville & Mexico.....	3,555	2,039,923	618,494	2,854,523	590,943	525,460	76,535	802,381	6,894	62,760	2,048,552	805,991	131,600	673,584	113,406	113,406
St. Louis, Iron Mountain & Southern.....	9	67,897	330	186,849	32,130	12,304	828	83,630	.....	6,821	135,713	51,136	7,600	43,535	13,055	13,055
St. Louis Merchants' Bridge Terminal.....	235	493,086	162,707	655,793	13,669	17,388	30,781	171,252	.....	4,702	82,868	23,799	1,565	22,234	4,296	4,296
St. Louis, San Francisco & Texas.....	943	270,113	109,473	379,586	54,291	119,236	18,340	149,212	3,169	24,649	403,759	282,371	32,166	250,038	75,336	75,336
St. Louis Southwestern of Texas.....	811	270,153	109,473	379,586	54,291	119,236	18,340	149,212	3,169	24,649	403,759	282,371	32,166	250,038	75,336	75,336
St. Louis Southwestern of Texas.....	726	171,832	124,167	317,352	55,271	44,574	8,090	143,515	.....	12,089	263,185	54,166	20,000	34,166	12,904	12,904
San Antonio & Aransas Pass.....	1,154	631,919	304,970	1,024,318	85,890	133,311	31,763	263,381	20,412	19,290	547,357	476,961	50,174	426,726	28,617	28,617
San Pedro, Los Angeles & Salt Lake.....	3,449	1,094,663	421,733	1,916,605	258,956	331,229	71,466	640,319	10,933	16,292	1,373,035	318,570	105,002	1,267,533	83,029	83,029
Seaboard.....	6,983	3,498,985	1,444,612	5,481,475	699,192	965,293	160,931	1,946,165	42,266	177,197	3,945,151	1,536,324	253,489	3,691,662	14,900	14,900
Southern.....	281	49,052	24,388	80,870	22,675	8,567	2,501	34,873	.....	3,473	72,089	8,781	8,350	66,719	72,770	72,770
Southern in Mississippi.....	6,950	7,254,919	2,816,513	10,066,857	994,748	1,560,714	173,963	3,315,240	160,156	237,847	6,428,174	4,538,683	440,112	4,096,606	72,470	72,470
Southern Pacific.....	555	258,787	177,642	480,589	59,434	40,598	8,717	95,899	5,077	15,027	223,987	256,602	57,445	199,026	30,485	30,485
Spokane, Portland & Seattle.....	295	97,054	40,666	145,046	22,462	19,470	4,329	48,291	.....	6,649	102,300	42,746	4,566	38,173	16,751	16,751
Tennessee Central.....	37	243,817	96,212	339,999	23,245	16,638	7,853	68,334	.....	3,281	112,440	119,993	27,485	92,145	17,362	17,362
Terminal R. R. Ass'n of St. Louis.....	468	999,949	501,393	1,607,780	47,670	90,722	41,301	114,973	14,196	10,453	285,682	90,618	19,816	70,439	9,442	9,442
Texas & New Orleans.....	1,944	243,817	96,212	339,999	23,245	16,638	7,853	68,334	.....	3,281	112,440	119,993	27,485	92,145	17,362	17,362
Texas & Pacific.....	436	485,685	63,789	592,757	71,606	137,491	7,247	184,908	1,916	10,440	413,608	179,149	23,501	155,513	61,534	61,534
Toledo & Ohio Central.....	248	52,919	35,485	66,568	15,466	30,620	2,096	35,553	.....	3,977	87,712	8,856	6,500	2,356	11,312	11,312
Toledo, Peoria & Western.....	451	388,894	67,552	456,446	68,385	71,739	16,785	152,320	.....	8,842	317,060	166,931	17,500	50,922	50,922	50,922
Toledo, St. Louis & Western.....	129	40,166	76,626	116,792	11,901	12,253	2,995	41,301	286	13,053						

Traffic News

The executive committee of the American National Live Stock Association, at its recent meeting in Denver, adopted resolutions asking Congress to define the authority of the Interstate Commerce Commission as to freight rates on intrastate traffic.

Traffic through the Panama Canal was suspended from August 30 to September 7, inclusive, for ships drawing over 17 ft. of water by a sudden forward movement of the large rock at the base of Cucaracha slide. On September 8 the movement of ships was resumed and on the 9th the last of the waiting vessels passed through the cut.

Beginning with the sailing of the steamship *Advance* on September 20, the ships of the Panama Railroad Line are now leaving Cristobal, Panama, for New York on Wednesday instead of Thursday. Arrival in New York will be on Tuesday for the *Panama*, *Allianca*, and *Colon*, and on Wednesday for the *Advance*. Sailings from New York will continue to be on Thursday.

It was announced on September 27 that the Pacific Coast Steamship Company, owned in New York, and the Pacific-Alaska Navigation Company had been consolidated into a new corporation to be known as the Pacific Steamship Company. The merger, affecting thirteen large passenger and freight steamships of the Pacific Coast Steamship Company and nine vessels of the Pacific-Alaska, will go into effect November 1. The vessels involved are said to be valued at about \$12,000,000.

Following the conference of grain dealers and carriers called by the State Public Utilities Commission of Illinois last week, that body has issued an order providing for the equitable distribution of freight cars for the shipment of grain. The railroads of the state are asked to compile data from all stations and elevators along the line to show the amount of business done by the individual elevators during the last four years. The cars will then be distributed pro rata, each station and elevator receiving cars according to the amount of business done. The data must be filed with the commission by December 1.

The Delaware & Hudson, in its studies of automobile travel and the influence of such travel on railroad business, has counted the attendance at fairs held recently at Altamont, N. Y., Hudson Falls, N. Y., and Rutland, Vt.; and finds that large percentages of the persons attending these fairs were carried in their own cars. Two days' count at Altamont showed the number of paid admissions to be 5,820, and the number of persons coming by automobile, 2,026. At Hudson Falls, in four days the attendance was 13,578; and of this number of persons 3,195 traveled in automobiles. At Rutland, out of 13,000 paid admissions, it was found that 3,113 persons had traveled in automobiles.

J. M. Roberts, superintendent of freight transportation of the Pennsylvania Lines West, has addressed a letter to the general superintendents of the company pointing to the serious shortage of open flat cars and urging that every effort be made to keep this class of cars from leaving the company's lines. On September 1 there were located on foreign lines 55,361 of the 162,466 open cars owned by the Pennsylvania System Lines. The letter states that the loss of these cars is due particularly to the practice of shippers in disposing of the products of their plants and factories on a basis of attractive prices, irrespective of the destinations of the shipments. It further points out that the financial advantages to be gained by the shippers by shipping off the System is likely to be overcome in the majority of cases by losses to the shippers through their inability to obtain cars.

Traffic League Takes Up Federal Investigation

Under date of September 20 the National Industrial Traffic League issued to its members a circular letter calling attention to the report of its legislative committee on Senate Joint Resolution No. 60, providing for a general investigation of railway regulation. The report pointed out that there is involved in

this investigation the question whether the present public policy of a dual system of regulation, state and federal, shall be changed to a policy of exclusive federal control. Members of the league are also enjoined to give consideration to the related matters of taxation, physical operation, train service, hours of service, police power, etc.

For the purpose of crystallizing the sentiment of the membership of the league, the circular presents a series of questions which members are requested to answer specifically, after taking them up with the commercial organization or individual concern the members respectively represent, the answers to be laid before the league at its annual meeting or at a special meeting which may be called prior to the beginning of hearings before the Newlands committee on or about November 20. The questions follow:

1. Shall the League favor exclusive federal control or regulation as opposed to the present dual system?
2. Shall the League favor exclusive federal incorporation of all common carriers and federal regulation of the issuance of securities?
3. If there is to be exclusive federal incorporation and regulation, what shall be done about taxation? Shall the state continue to tax, or shall the tax be fixed and controlled by the federal government, and then apportioned among the states traversed by the respective railroads?
4. If exclusive federal control is to be the policy, what shall be done about the police power of the state, the right to regulate hours of service, operation of trains on Sundays and legal holidays, speed limits, fencing, track elevation, etc.?
5. What changes are necessary in the present Act to Regulate Commerce? Why?
6. If you favor exclusive federal control: A—Shall such an act be administered by one commission? B—How many members? How selected? C—How should such a body be organized? D—If regional, how should the regions be determined? Why? E—Should the power of the regional commissioners be final or subject to some central body?
7. If you favor the present system: A—Shall the Interstate Commerce Commission be reorganized? Why? B—If so, how? Merely by increasing its members with authority to subdivide itself in divisions for separate parts of its work, or should it be largely increased with units sitting permanently in different parts of the country? Why?
8. The League desires its members also to discuss and offer suggestions or recommendations upon any phase of this general subject that may be of interest to the member responding.

The officers of the league express the view that this is the most important subject that has ever come before the organization and that members should consider it from the broad viewpoint of the public interest.

TURKEY CANCELS RAILROAD GRANTS.—The Turkish government has canceled the French concession for the building of a railroad from Smyrna to Kassaba, a town of Asia Minor, 54 miles southeast of Konieh. The government also has annulled the Franco-Belgian concession for the construction of a railroad from Mudania, an Asia Minor town on the Sea of Marmora, to Brusa, about 100 miles further southeast. These enterprises, it is said, will be bought back by the Turkish government.

CHANGE OF GAGE ON JAPANESE RAILWAYS.—The Japanese Diet has appointed another committee to investigate the question of substituting broad gage for the present narrow gage on the government railways. It is expected that recommendations in favor of the work will be adopted in the next fiscal year's budget. The work of reconstruction would be started on the trunk line on the main island, with treasury funds amounting to nearly \$10,000,000, the deficit to be covered from the railway funds.

CEMENT FOR STEAM PIPES.—Cement of specially valuable properties for steam pipes and for filling up small leaks such as blow-holes in a casting, without the necessity of removing the injured pieces, is composed of 5 parts by weight of paris white, 5 of yellow ochre, 10 of litharge, 5 of red lead and 4 of black oxide manganese, these various materials being mixed with great thoroughness, a small quantity of asbestos and boiled oil being afterward added. The composition, as thus prepared, will set hard in from two to five hours, and possesses the advantage of not being subject to expansion and contraction to such an extent as to cause leakage afterward, and its efficiency in places difficult of access is important.—*Power*.

FEMALE LABOR IN GERMAN MINES.—From the very beginning of the war the German mining industry has been very seriously handicapped by shortage of labor, and female labor is being exploited on an increasing scale. It is now said that the number of female hands employed in the mining industry of Germany amounts to 45,500, against 5,500 at the beginning of the war.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

W. M. Daniels, commissioner, opened hearings at Chicago last week on the proposed readjustment of rates on cement in Western Trunk Line territory.

The commission has suspended until January 25, 1917, the operation of a tariff filed by the Toledo, St. Louis & Western providing for the cancellation of commodity rates on straw in carloads from various points in Indiana to Coshocton, Ohio, and for the future application of class rates thereon.

The commission has suspended from September 22 to January 20, 1917, the operation of certain schedules in tariffs filed by southwestern roads providing for a charge of \$1 and \$2 for bedding single deck and double deck stock cars in connection with traffic originating in southwestern territory.

Eugene Morris, chairman of the Central Freight Association, has filed with the commission, freight tariffs, effective December 1, establishing a new scale of class rates in C. F. A. territory. They contain many advances over the present local tariffs. These advances are in addition to those allowed by the commission in its decision in the five-per cent case. The tariffs have been under preparation for some time. The commission indicated, in the five-per cent decision, that the railroad companies in this territory needed a larger increase in revenues than did the trunk lines.

The Cadillac (Mich.) Chamber of Commerce and the Cadillac Lumber Exchange have filed a complaint with the Interstate Commerce Commission against the present relation of rates between Cadillac and points in trunk line territory and the Chicago-New York scale. Class rates between Cadillac and New York are now 110 per cent of the Chicago-New York scale and commodity rates between Cadillac and points in trunk line territory have a varying relation to that scale, the rates on lumber and lumber products being 100 per cent. It is alleged that lower rates are applicable to points on or adjacent to the west bank of Lake Michigan as to which Cadillac is an intermediate point and the petition asks that rates between Cadillac and New York should not exceed 100 per cent and that lumber rates should not exceed 90 per cent of the scale.

The Interstate Commerce Commission has issued a supplemental order in the transcontinental rate case suspending until December 30 a proposed increase in rates on barley which was to become effective on September 25. The commission has also suspended from September 25 to January 23, 1917, the operation of tariffs providing for increased rates on lumber and other forest products originating in Pacific coast territory via the Northern Pacific and Great Northern to stations in Michigan on the Copper Range. The proposed increase is to a combination basis of rates which would result in advances ranging from 2½ to 9 cents per 100 lb. The commission has also amended its order of June 25, which rescinded its relief under the fourth section on rates to the Pacific coast, to become effective on December 30 instead of September 1. Tariffs filed by the carriers which were to become effective on September 1 were suspended by the commission on August 29 and the effect was to continue in force rates established by authority of the previous fourth section orders during the life of the suspension order.

Advances on Coal in Chicago Switching District

Opinion by Commissioner Clements:

In the original report in this proceeding it was held that the respondents had not justified proposed increased rates on coal and coke from mines in various states to points on the line of the Chicago, Milwaukee & St. Paul in Chicago, 27 I. C. C., 71. The carrier named performs only a terminal service in Chicago on this traffic. It now asks that the commission fix the division which it may receive out of the through rate; *Held*, That upon the whole situation the commission does not feel justified in ordering a basis of divisions different from that now existing. (41 I. C. C., 302.)

STATE COMMISSIONS

New Fiscal Year in Pennsylvania

The Public Service Commission of Pennsylvania has adopted a resolution fixing the fiscal year for reports made to the Commission to end December 31. All companies are notified, however, to file the usual annual report for the fiscal year ending June 30, 1916.

COURT NEWS

The hearing in the injunction suit of the Texas railroads to restrain the operation of an order of the Texas Railroad Commission cancelling its previous orders allowing an increase in intrastate freight rates, which had been set for September 28 at Atlanta, Ga., was expected to be postponed until the November term of the federal circuit court, and to be held at Ft. Worth, Tex.

The attorney general of the United States has filed a brief in the Supreme Court in the appeal from the federal district court for the eastern district of Pennsylvania in the case against the Lehigh Valley and its subsidiary companies for alleged violations of the Sherman anti-trust law. The contention of the government is that the railroad and its subsidiary companies have created a monopoly in the mining and moving to market of anthracite coal.

Upon application of the governor, the attorney-general and the state railway commission, the Supreme Court of Nebraska, on September 22, issued an order restraining the railroads doing business in the state from putting into effect the new freight tariffs which were prepared following the order of the Interstate Commerce Commission in the Missouri-Nebraska cases. The new tariffs, increasing the class rates, were intended to replace those prescribed in order No. 19, which has been in effect in Nebraska for two years.

The attorney general of the United States has filed with the Supreme Court his brief in the oil-tank car cases asking the court to reverse the Pennsylvania district court which enjoined the Interstate Commerce Commission from compelling the Pennsylvania Railroad to furnish oil-tank cars to shippers. A statement issued by the department of justice says that these cases are among the most important which have arisen under the interstate commerce law in recent years, and that they "present for decision for the first time whether violation of the established duty of a common carrier to provide and furnish cars may be remedied by the commission's order or solely by suit in the courts."

The Union Pacific has filed a suit in the United States District Court at Kansas City, Mo., to enjoin the members of the Public Service Commission of Missouri from interfering with the issuance of \$2,000,000 in bonds and from attempting to impose any penalties for not submitting the bond issue to that body for approval. The state of Missouri has a law which requires all railroad companies to obtain a certificate before issuing stocks and bonds and it provides for heavy fines against the corporation and imprisonment for its officers if bonds are issued without obtaining such a certificate. The law also provides for the payment of a fee graduated according to the amount of the bonds, with a minimum fee of \$250. In 1914 the Union Pacific applied to the Public Service Commission of Missouri for authority to issue about \$31,000,000 in new bonds. Authority was given and a fee of \$10,962.25 was imposed. An appeal was taken from the order of the commission to the Circuit Court of Cole county, Missouri, where the order was reversed and judgment rendered fixing the amount of the fee at \$250. The commission carried the case to the Supreme Court, where the judgment was reversed on a technicality, nothing being said as to the validity of the law or its application to foreign corporations. That case will be appealed to the Supreme Court of the United States. The Union Pacific now wishes to issue about \$2,000,000 in bonds and has asked for an injunction to prevent interference with its purpose. The Union Pacific owns but a half mile of track in Missouri, and is a Utah corporation engaged (in Missouri) exclusively in interstate commerce. The question is squarely presented whether a state can impose any conditions upon a foreign

corporation which happens to be doing nothing but interstate commerce within its borders.

Taxation

An appeal from an assessment of a state tax on the property of the Illinois Central, the Illinois Supreme Court holds that the tax was based upon a contract, and was not an ordinary tax, and was not to be fixed by the judgment of the state auditor, but according to the Illinois general revenue law, and by the same rules as used by other officers in listing and assessing state taxes.—*People v. Illinois Central (Ill.)*, 112 N. E., 701.

Violation of Yard Speed Rule

In an action for personal injuries to an engineman, brought under the federal employers' liability act, the Arkansas Supreme Court holds that an instruction that the plaintiff could not recover if he violated the rule requiring his train not to exceed 10 miles an hour through yard limits, was improperly refused.—*St. Louis, I. M. & S. (Ark.)*, 187 S. W., 920.

Other Railroads' Customs Admissible in Evidence

In a fireman's action for injury when his shovel struck the edge of a hole in the metal sheet constituting the floor of the tender (used to allow the coupling pin of the draw bar to pass through) so that he was thrown down and his wrist broken, the issue was whether the railroad was negligent in making the hole too large. The Arkansas Supreme Court held that evidence for the railroad that it was about the customary size of that on other railroads was admissible as evidence of what a reasonably prudent employer would ordinarily do, but not conclusive evidence thereof; and the exclusion of such evidence was reversible error.—*St. Louis & San Francisco (Ark.)*, 187 S. W., 319.

Right to Refuse Live Stock

Under the interstate commerce act, a connecting carrier would ordinarily be required to take an interstate shipment; but if one of its bridges was down so that it would be impossible to move the freight (in this case a car of hogs) within a reasonable time, the carrier has a right to refuse the shipment unless the shipper will agree to make it subject to delay on account of the bridge. This is the decision of the Kansas City (Mo.) Court of Appeals. The carrier has a right to demand that such a provision be inserted for its protection in the shipping contract, provided it notifies the shipper and gets his consent thereto before accepting the shipment. This right exists and is the same whether the shipment is interstate or intrastate.—*Bowles v. Quincy, Omaha & Kansas City (Mo.)*, 187 S. W., 151.

Libel of Common Carrier

A Washington statute of 1911 prohibits discrimination by common carriers, in favor of either persons or localities, while section 94 makes a violation of the act an offense. A navigation company sued for libel a person who caused to be published in a local newspaper an article (signed) "urging the public to patronize a competitor of the plaintiff." One of the statements alleged to be libelous was that he believed the county to be fully 10 years behind what it should be because of unjust discrimination in the freight and passenger rates charged by the navigation company. The Federal District Court, western district of Washington, held that this statement was not libelous, as charging the navigation company with an offense under the laws, but should be treated merely as a severe criticism of the company's methods.

Another statement was that the company had driven competitors from the field, and had robbed the people of the locality for years, but now protested when they sought to dictate rates. It was held that, as words not actionable may become so if they contain a covert and hidden meaning, this publication was libelous. It tended to injure the navigation company in its business. The innuendo as to robbery meant, not a technical robbery, but the imposition of rates which were so exorbitant that they deprived patrons of the navigation company of their money without just return. *Puget Sound Nav. Co. v. Carter*, 233 Fed. 832.

Railway Officers

Executive, Financial, Legal and Accounting

B. F. LaRue, assistant general solicitor of the Lehigh Valley at New York, having resigned to enter the general practice of law in New York City, W. F. Gleeson, claims adjuster at New York, has been appointed chief claim agent. Mr. Gleeson will have charge of the investigation of accidents to persons and damage to property (other than property in transit) and the settlement of claims.

William D. Fenton, who recently retired as general counsel of the Southern Pacific Lines in Oregon, with office at Portland, Ore., was born June 29, 1853, in Scotland County, Mo. He received his early education in the public schools of Missouri and Oregon, later entering Chuteau College at Monmouth, Ore., from which latter institution he graduated in 1872. After some years of general legal practice he was appointed counsel of the Southern Pacific with headquarters at Portland, Ore., having jurisdiction over this company's lines in Oregon. He has been in active railway service for nearly 25 years and now retires to private practice.

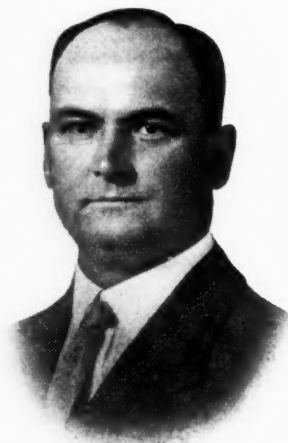
Ben C. Dey, whose appointment as general counsel of the Southern Pacific Lines in Oregon, with office at Portland, Ore., has just been announced, was born December 29, 1879, at Oregon City, Ore. He attended the public schools of his native city and later graduated from the Portland High School in 1900, shortly thereafter he matriculated at Stanford University and took a complete full four years' course at this latter institution. He entered railway service on January 1, 1906, in the legal department of the Southern Pacific and has just succeeded William D. Fenton, resigned, as general counsel of the Southern Pacific, having jurisdiction over the company's lines in the state of Oregon.

Operating

W. J. Pickrell has been appointed assistant superintendent, District No. 1, of the Canadian Pacific, with office at Farnham, Que.

George G. Derby, the announcement of whose promotion from roadmaster of the Atchison, Topeka & Santa Fe at Newton, Kans., to be superintendent of the Oklahoma division with office

at Arkansas City, Kans., was recently made, was born in Pennsylvania. He received his early education at the high school in Meadville, Pa., and later on entered Allegheny college. His leaning toward railway service began when he was very young, causing him to seek employment during his annual school vacations. After leaving college he abandoned the study of law, which profession he had taken up in the meantime, to accept service with the Erie Railroad. After working in various capacities in stations, yards and in the trans-



G. G. Derby

portation department, he was appointed yardmaster at Jamestown, N. Y. He was holding this position when he decided to go west, shortly thereafter entering the employ of the Atchison, Topeka & Santa Fe. With this latter company he has been located at several points along the Arkansas River, Rio Grande & Middle divisions. About six years ago he was appointed trainmaster with office at Newton, Kans. His present appointment as superintendent became effective September 15.

R. J. Harlan, superintendent of the Southwestern division of the Central of Georgia at Macon, Ga., has been appointed general manager of the Wadley Southern Railway, with headquarters at Wadley, Ga., vice T. T. Hollomon, general superintendent, resigned.

Henry Baldwin, superintendent of the Columbus division, of the Central of Georgia at Columbus, Ga., has been appointed superintendent of the Southwestern division, succeeding R. J. Harlan, resigned to go to another company. E. P. McLain, transportation inspector at Savannah, has been appointed superintendent of the Columbus division, succeeding Mr. Baldwin, and C. E. Scarborough, trainmaster at Savannah, has been appointed transportation inspector succeeding Mr. McLain.

F. D. Kelsey has been appointed general superintendent of the Central division of the Great Northern, with headquarters at Great Falls, Mont., succeeding C. E. Leverich, resigned. W. R. Smith, division superintendent at Everett, Wash., has been appointed assistant general superintendent of the Central district, with office at Great Falls, succeeding Mr. Kelsey. J. M. Doyle has been appointed superintendent of the Cascade division, with office at Everett, Wash., succeeding Mr. Smith. A. K. Stone has been appointed superintendent of the Montana division, with office at Havre, Mont., succeeding Mr. Doyle, and H. W. Sheridan has been appointed superintendent of the Kalispell division, with headquarters at Whitefish, Mont., succeeding J. J. Darling, transferred.

Rolla Jabish Parker, whose appointment as general manager, Western lines, Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., has just been announced, was born June



R. J. Parker

27, 1857, at Roscoe, Minn. He received his early education at the Shattuck School, Faribault, Minn., and entered railway service in 1872 as a brakeman on the Chicago, Milwaukee & St. Paul. In 1877 he was promoted to be a conductor, and held this position until 1881. From 1881 to 1884 he was conductor of a construction train on the Northern Pacific and from 1884 to 1887 held the same position with the Atchison, Topeka & Santa Fe. From this time on he has been continuously in the employ of the Santa Fe, having passed consecutively through the following grades: May, 1887, to December, 1892, division roadmaster; December, 1892, to January, 1897, general roadmaster at Topeka, Kan.; January, 1897, to February, 1900, superintendent of Middle division at Newton, Kan.; February, 1900, to January, 1901, superintendent of the Western division at Pueblo, Colo.; from January, 1901, to April, 1903, he was superintendent of the Colorado division with same headquarters; April, 1903, to June, 1905, he was superintendent of the Missouri division at Marceline, Mo.; June, 1905, to August, 1907, he was general superintendent of the Western Grand division at La Junta, Colo.; August, 1907, to April, 1909, he was general superintendent of the Central Grand division at Newton, Kans.; from April, 1909, to October, 1910, he was general superintendent at La Junta, Colo.; October, 1910, to his present appointment, which became effective September 7, he was general superintendent, Eastern lines, with headquarters at Topeka, Kans.

Traffic

H. A. Jordan, general freight and passenger agent of the Wadley Southern at Swainsboro, Ga., has resigned, and that office has been abolished. Effective October 1. All matters pertaining to operation and traffic will in future be handled by the general manager.

Engineering and Rolling Stock

H. A. Lane, assistant engineer of surveys of the Baltimore & Ohio at Baltimore, Md., has been promoted to assistant to the chief engineer of the Baltimore & Ohio system.

H. A. Macbeth, superintendent of motive power of the New York, Chicago & St. Louis at Cleveland, Ohio, has been appointed assistant to superintendent of motive power.

George Durham, master mechanic of the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed superintendent of motive power and cars of the Wheeling & Lake Erie with office at Brewster, Ohio. Mr.



G. Durham

Durham was born on October 10, 1875 at Pineville, Ky., and was educated in the common schools of his native town and later at Kentucky University, Lexington, Ky. He then entered the service of the Louisville & Nashville as a special apprentice and later served consecutively as a machinist, locomotive fireman, engineman, traveling engineer and general foreman until February 1, 1907. He was then appointed master mechanic of the Knoxville & Atlan-

ta division with headquarters at Etowah, Tenn., remaining in that position until October 1, 1908, when he was made master mechanic of the same road at South Louisville, Ky. On April, 1911, he left that position and was appointed master mechanic of the Scranton, Bangor & Portland and Syracuse & Utica divisions of the Delaware, Lackawanna & Western, which position he held until his appointment on September 15, 1916, as superintendent of motive power and cars of the Wheeling & Lake Erie, as above noted.

A. R. Ayers, principal assistant engineer, equipment department, of the New York Central lines east of Buffalo, with office at New York, has been appointed superintendent of motive



A. R. Ayers

power of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio. Mr. Ayers was born on October 26, 1878, at Toledo, Ohio, and graduated from Cornell University in 1900 as a mechanical engineer. He began railway work with the Lake Shore & Michigan Southern as a special apprentice in the same year. He was special inspector from 1903 to 1905, and in the latter year was made night engine house foreman at Elkhart, Ind. The next year he was made assistant general foreman of the Collinwood shops,

and in 1907 was promoted to superintendent of shops at Elkhart. From January 1, 1908, to November 1 of the same year he was assistant superintendent of shops at Collinwood, and on the latter date was appointed assistant master mechanic, with office at Elkhart on the same road. He was appointed mechanical engineer of the Lake Shore, the Chicago, Indiana & Southern and the Indiana Harbor Belt, with office at Cleveland in 1910, and in March, 1912, was appointed general mechanical engineer

of all the New York Central lines west of Buffalo, with office at Chicago. In February, 1915, he was appointed principal assistant engineer, equipment department of the New York Central lines east of Buffalo, with office at New York, and on October 1 leaves that road to become superintendent of motive power of the New York, Chicago & St. Louis, with headquarters at Cleveland, as above noted.

H. E. Stevens, engineer of bridges, Northern Pacific, with office at St. Paul, Minn., has been appointed chief engineer, succeeding W. L. Darling, resigned. Mr. Darling's resignation became effective on September 21.

Purchasing

Glenn G. Conklin, stationer of the Buffalo, Rochester & Pittsburgh at Rochester, N. Y., has resigned. Effective September 27.

J. F. Pratt has been appointed general storekeeper of the Great Northern, with office at St. Paul, Minn., succeeding John Opheim, transferred.

Francis J. O'Connor, who has just been appointed general storekeeper of the Chicago, Milwaukee & St. Paul, with office at Milwaukee, Wis., was born August 18, 1874, at El Paso, Ill. After an elementary education he took a course at Green Bay Business College, leaving there early in 1891. In May of this same year he obtained employment with the Chicago, Milwaukee & St. Paul as stenographer and clerk in the store department at Green Bay, Wis., which position he held until November, 1894. From November, 1894, to July, 1895, he was storekeeper with headquarters at this same place, being then appointed clerk and foreman in the general store department at Milwaukee, Wis. From February, 1901, to November, 1902, he was chief clerk to the master mechanic of the Milwaukee shops and from November, 1902, to May, 1904, he was signal inspector and assistant signal engineer. In May, 1904, he was appointed chief clerk to the superintendent of motive power and held this position until assigned to the office of general storekeeper September, 15.



F. J. O'Connor

OBITUARY

W. A. Thomas, master mechanic of the Virginian Railway, was killed in a derailment on the Virginian Railway near Alberta, Va., on September 20.

Allen J. Sovereign, formerly division superintendent of the Northern Pacific, with office at Staples, Minn., and who was granted an indefinite leave of absence in January, 1914, while holding this position, died at his home in St. Paul, Minn., September 19.

RAILROAD BUILDING IN SOUTHERN MANCHURIA.—Steps are being taken by the South Manchuria Railway Company to commence work on the Ssuningkai-Chengchiatun section of the Ssuningkai-Taonanfu Railway, a preliminary agreement for which was concluded by China and Japan in 1913. The detailed loan agreement for the construction of this section, 65 miles in length, was negotiated during the year. The whole line, which will be 165 miles in length, is expected to prove a profitable feeder to the South Manchuria Railway. The total cost of the first section is estimated at \$1,500,000. The only work in this section attended with engineering difficulty is the bridge over the Liao river. There is a danger that the river traffic on the Liao above Chengchiatun may be seriously hampered by the construction of this bridge in the vicinity of the latter town.

Equipment and Supplies

LOCOMOTIVES

THE MINNESOTA STEEL COMPANY is in the market for a number of locomotives.

THE MISSOURI PACIFIC is reported to be inquiring for a number of locomotives.

THE UNION PACIFIC is contemplating the purchase of 10 Santa Fe type locomotives.

THE NORFOLK & WESTERN is inquiring for a number of Mountain type locomotives.

THE BUFFALO & SUSQUEHANNA has ordered one locomotive from the Baldwin Locomotive Works.

THE CANTON RAILROAD has ordered one switching locomotive from the Baldwin Locomotive Works.

THE UNITED RAILROADS OF YUCATAN have ordered 2 10-wheel locomotives from the Baldwin Locomotive Works.

THE WILWIN COMPANY, LTD., Mackinaw, Mich., has ordered one 2-4-2 type locomotive from the Baldwin Locomotive Works.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is inquiring for four Mountain type (4-8-2) and for six Mikado type locomotives.

LAURENCE MARQUES has ordered 3 Santa Fe type locomotives for Portuguese East Africa from the Baldwin Locomotive Works.

THE PHILADELPHIA ELECTRIC COMPANY, Philadelphia, Pa., has ordered one 0-4-0 type locomotive from the Baldwin Locomotive Works.

THE BINGHAM & GARFIELD has ordered one superheater 0-8-8-0 Mallet type locomotive from the American Locomotive Company. This locomotive will have 26 and 41 by 28-in. cylinders, 51-in. driving wheels and a total weight in working order of 461,000 lb.

THE GUANICA CENTRALE RAILWAY (PORTO RICO) has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 20-in. cylinders, 38-in. driving wheels and a total weight in working order of 64,000 lb.

THE NEW YORK CENTRAL was reported in last week's issue as having ordered 115 locomotives from the American Locomotive Company. The order consists of 10 Pacific type, 5 Mallets, 55 Mohawk type, and 45 eight-wheel switchers. The Pacific type locomotives will have 23½ by 26 in. cylinders, 79-in. driving wheels and a total weight in working order of 273,000 lb. The Mallets will have 21½ and 34 by 32-in. cylinders, 57-in. driving wheels and a total weight in working order of 354,000 lb. The Mohawk type will have 28 by 28-in. cylinders, 69-in. driving wheels and a total weight in working order of 343,000 lb. The eight-wheel switchers will have 23½ by 30-in. cylinders, 57-in. driving wheels and a total weight in working order of 213,000 lb. All these locomotives will be equipped with superheaters.

FREIGHT CARS

THE UTAH COPPER COMPANY is inquiring for 150 ore cars.

THE ELGIN, JOILET & EASTERN is inquiring for 300 hopper cars.

THE ST. LOUIS SOUTHWESTERN is repairing 500 cars in its own shops.

THE MISSOURI, KANSAS & TEXAS is reported in the market for 2,000 box cars.

THE CHESAPEAKE & OHIO has ordered 1,000 70-ton steel hopper cars from the Pressed Steel Car Company.

THE MISSOURI PACIFIC is reported to have ordered 1,000 box cars from the American Car & Foundry Company.

THE NATIONAL REFINING COMPANY has ordered 60 40-ton 8,000-gal. tank cars from the American Car & Foundry Company.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 500 40-ton automobile cars from the Western Steel Car & Foundry Company.

THE INDIANAHOMA REFINING COMPANY, St. Louis, Mo., has bought 150 tank cars from the Standard Car Constructing Company.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has ordered 50 center constructions from the Mount Vernon Car Manufacturing Company.

THE ILLINOIS TRACTION COMPANY has ordered 60 50-ton hopper cars and 40 40-ton gondola cars from the American Car & Foundry Company.

THE KANSAS CITY REFINING COMPANY has bought 26 40-ton, 8,000-gal. and 24 50-ton 10,000-gal. steel tank cars from the American Car & Foundry Company.

PASSENGER CARS

THE ARIZONA COPPER COMPANY has ordered three narrow gage passenger cars from the American Car & Foundry Company.

IRON AND STEEL

THE FORT DODGE, DES MOINES & SOUTHERN has ordered 175 tons of steel for a railroad bridge.

THE DENVER UNION STOCK YARDS have ordered 181 tons of steel from the Hansell Elcock Company for an office building.

THE VANDALIA has ordered 778 tons of steel, for three riveted truss spans and one plate girder span for Indianapolis and Frankfort.

THE YAZOO & MISSISSIPPI VALLEY has ordered 167 tons of steel from the Virginia Bridge & Iron Company for transfer belt gallery at New Orleans, La.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 478 tons of steel from the American Bridge Company for use in building extension to ore docks at Superior, Wis.

ITALY RAISES RAILROAD RATES.—Railroad freight rates in Italy have been raised 10 per cent. It is estimated that by this action the government railroad revenues will be increased \$3,000,000 annually. The object in raising the rates was to secure money to pay extra wages of the railway employees totaling \$4,000,000, which were granted recently following complaints by the men of the high cost of living and the extra work entailed by reason of the war.

COAL CAR DISTRIBUTION IN SPAIN.—It appears that at Barcelona there are large numbers of cars loaded with coal which have been refused acceptance by the consignees owing to the poor quality of the coal. This practically immobilizes cars absolutely necessary in moving coal from the mines to industrial centers of the country. Accordingly, the railroads transporting the coal will be obliged to demand a certificate from the mine whence the coal proceeds showing quantity, to whom consigned, and by whom, so that in case it is not of the grade ordered the consignee may take up the case with the shipper. If the coal is not discharged by the consignee within 12 hours the railroad company will proceed to unload it at the expense of the consignee, without responsibility for loss or damage, unless this can be attributed to bad faith or negligence of employees. Each individual shipment must be kept separate, in order to permit the consignee to claim indemnification from the shipper. If the docks and freight yards of the transporting company are not large enough to permit of separately storing these shipments, more space may be rented at the expense of the consignee. Each coal transporting company must reserve a certain number of trains for coal, which they shall load to the maximum, and they shall inform the Ministry of Public Works within 15 days as to the number of cars needed by them for this purpose. In this way it may be arranged, if necessary, for one company to lease cars from another that has no immediate use for them.

Supply Trade News

The Railway Specialties Corporation, 29 Broadway, New York City, has been appointed eastern sales representative of the Denver Brass Works, Denver, Colo. Among the products manufactured by the Denver Brass Works are, injector repair parts, hose couplings, M. C. B. car journals and bearings, and the Swanson automatic flange lubricator.

Customers of the Carnegie Steel Company and other large steel companies in the Pittsburgh district have been notified regarding their early orders for steel delivery in 1917 that in the event the United States Government needs steel for the carrying out of its naval programs as an aid to preparedness, the government will be given reasonable first choice, and especially in delivery of steel plates and shapes for new naval vessels.

George W. Daves has been appointed a representative of the signal department of the Railroad Supply Company, with offices at 30 Church street, New York. Mr. Daves was for a number of years signal engineer of the Chicago & Alton, after which he went to the sales department of the Railroad Supply Company, later leaving that company to join the sales department of the Edison Storage Battery Company. He now returns to the signal department of the Railroad Supply Company, as noted.

Edward Cumberland Fisher, formerly assistant manager of the Cooke and Rogers works of the American Locomotive Company, has been appointed manager of the Cooke works of that company at Paterson, N. J.



Edward C. Fisher

He was born May 2, 1875, on a farm in Virginia. At the age of sixteen he entered the Virginia Mechanics' Institute, a night school of technology in Richmond, and at the same time entered the shops of the Tidewater & Western Railroad at Chester, Pa., as a machinist apprentice. Shortly after completing his apprenticeship he accepted the position of general foreman of the Petersburg Iron Works. When that firm failed about a year later he entered the employ of the Southern Railway in its shops at Spencer,

N. C., where he was soon made gang foreman. The following year he returned to Richmond as foreman of outside construction for the Richmond Iron Works, and shortly after was appointed instructor of mechanical drawing for the Chesapeake & Ohio in its apprentice school at Huntington, W. Va. This position he held until November 1, 1899, at which time he returned to Richmond as foreman for the Richmond Locomotive Works. After serving in various capacities, both in the drawing office and shops, he was transferred June 15, 1910, to Paterson, N. J., as superintendent of the Rogers works of the American Locomotive Company. In June, 1913, he was appointed assistant manager of the Cooke and Rogers works, and has now been appointed manager of the Cooke Works, as above noted.

The McKen Motor Car Company, Omaha, Neb., has recently delivered to the Ferrocarriles del Norte de Cuba a motor car of 200 h.p., equipped with the Type C engine. This is the one hundred and forty-eighth car sent out by this company. These are in service on 69 railroads, including roads in the United States, Mexico, Canada, Australia and Cuba. This car is being sent to Florida under its own power and will be used between Jucara and Moron. A short time ago a 300 h.p. car was delivered to the Southern Utah Railroad, which will operate on grades 8 miles long having 2½ to 3 per cent gradient, and over a

maximum grade of 4.92 per cent for two miles. The car is equipped with a six-wheel motor truck, the two leading driving axles being connected by side rods. It will operate at three speeds.

Louis Sears has been appointed manager of railway sales of the Willard Storage Battery Company, Cleveland, Ohio, succeeding the late W. E. Ballantine, whose death was announced in the *Railway Age Gazette* of January 21, 1916. Mr. Sears has been with the Willard Storage Battery Company since April, 1908, remaining at the factory until January, 1910, at which time he went to the Chicago office where he remained until October, 1913. He was in the Cleveland office October, 1913, to March, 1915, and from March, 1915, to August, 1916, he was located in the New York office. Mr. Sears was transferred to the Cleveland office and appointed manager of railway sales on August 1, 1916.

The Baldwin Locomotive Works have taken over a \$40,000,000 shrapnel contract made by the Eddystone Munitions Company with the Russian Government, and guaranteed by the British Government. Alba B. Johnson, president of the Baldwin Locomotive Works, in explanation of this deal has made the following statement: "The stock of the Eddystone Ammunition Corporation has been acquired by the Anglo-Russian Commission which will designate the board of directors. The corporation itself continues its corporate existence and its lesseeship of the building constructed for its use and is to continue to perform its contracts. The relationship of the Baldwin Locomotive Works in the matter of undertaking to carry on the business is in no wise altered. It has undertaken to render some services for the benefit of the Ammunition corporation for which it will be compensated in addition to a rental. The Baldwin Locomotive Works assumes no financial responsibility whatever."

The Texas Company

The Texas Company directors have voted 25 per cent increase in capital stock, subscription rights to which will be offered at par, \$100, to stockholders of record November 30; payments to be made in two instalments of 50 per cent each, due on or before January 5, and April 5, 1917, respectively. New stock will share in earnings from April 1, 1917. Interest at rate of 6 per cent per annum will apply on installments paid from January 5 to April 5. Stockholders will be asked to ratify these recommendations at the annual meeting at Houston, Texas, on November 14. The increase will amount to \$11,500,000 and will bring total outstanding capital of the Texas Company up to \$55,500,000. Present outstanding capital is \$37,000,000, but this will become \$44,400,000 October 5, next, with payment of final installment of \$7,400,000 new stock offered to shareholders last March. That increase involved the offering of rights to stockholders to subscribe to 20 per cent of their holdings at par. These rights last year sold as high as \$20 each on a when-issued basis. Proceeds of sale of new stock as heretofore are to be applied solely to extension of plants and other facilities to take care of the continued and rapid growth of business.

TRADE PUBLICATIONS

DRILLS AND REAMERS.—Catalogue No. 15, issued by the Celfor Tool Company, Buchanan, Mich., is a 90-page book in which is listed the complete line of standard drills and reamers manufactured by this company. The catalogue also contains a list of drill chucks, drill sockets, lathe tool holders, tool bits, flue cutters and drill gages.

UNIVERSAL ELECTRIC HAMMER DRILL.—Bulletin E-43 has just been issued by the Chicago Pneumatic Tool Company, describing the Duntley universal electric hammer drill. This tool is designed for use in drilling stone or concrete, as well as for light chipping and is equipped with a motor that will operate interchangeably on direct or alternating current.

BULB SECTIONS.—Under date of September 1, the Carnegie Steel Company, Pittsburgh, Pa., has issued a third edition of "Bulb Sections," a 17-page pamphlet, in which are catalogued the bulb angle and beam section, limited quantities of which are used in the car and ship building trades. These sections are not carried in stock, but are furnished on order. The usual data concerning the dimensions and properties of the sections are given.

Railway Construction

ANTHONY & NORTHERN.—This company has finished work on an extension from Gibson, Kan., west to Kinsley, 8 miles. (July 14, p. 39.)

This company has awarded contracts for the grading of its new line from Larned, Kan., to Hays City. The track laying and bridge building will be done by the company's own forces. There will be approximately 8,000 cu. yd. of excavation per mile; the maximum grade is 1 per cent, and the maximum curve about 3 deg. J. E. Waite, Hutchinson, Kan., is in active supervision of the undertaking.

CAROLINA SOUTHERN.—Incorporated in South Carolina with \$30,000 capital to build a railway from Orangeburg, S. C. south to Estill or to a point near Estill, in Hampton county about 60 miles. The headquarters of the company are at Orangeburg, and the incorporators include E. N. Mittle, Bowman; J. Leroy Dukes, Orangeburg, and W. C. Martin, Branchville.

CHICAGO, MILWAUKEE & ST. PAUL.—The report of this company for the year ended June 30, 1916, shows that the eastern extension of the Seattle, Port Angeles & Western was completed and placed in operation in May, 1916, and an extension from Majestic, Wash., west about six miles is about 25 per cent completed. An extension of the Big Blackfoot Railway from McNamara Junction to Clear Water, Mont., 20 miles, is under way, and is about 5 per cent completed. Work on a branch line from a point on the main line of the Bellingham & Northern, near Goshen, Wash., to Welcome, 11.3 miles, was started early in 1915, and the work is about 95 per cent completed. The construction of the Choteau line from Great Falls, Mont., northwest to Agawam, 70 miles is nearing completion, track laying is now in progress and it is expected that the line will be placed in operation during 1916. The work of depressing the tracks of the Hastings and Dakota division from Hiawatha avenue to Hennepin avenue, in the city of Minneapolis, 3 miles, is about 88 per cent completed and all the grade crossings have been eliminated and work on the remaining seven overhead viaducts is under way. A new viaduct carrying Lake street over the tracks of the Hastings & Dakota division in Minneapolis is now under construction, and it is expected will be completed this coming winter. The elevation of tracks on the Chicago & Evanston division from Montrose avenue to Howard avenue, Chicago, Ill., 4.4 miles, is under construction and about 45 per cent of the work is completed. The elevation of tracks in the city of Milwaukee, Wis., is about 85 per cent completed.

FORT DODGE, DES MOINES & SOUTHERN (ELECTRIC).—This company is building an extension of its line from Gypsum, Iowa, to Brushy, Iowa, a distance of 7½ miles. Contracts for the grading have been let to Donald Jeffery, Delmar, Iowa, and Duggan & Naylor, Omaha, Neb. The bridges, of which there will be three—two concrete box culverts and one 50-ft. deck girder span on concrete abutments—will be built by A. H. Neumann & Company, Des Moines, Iowa. About 16 tons of steel and 1,200 cu. yd. of concrete will be needed for this latter undertaking. The excavation will average 13,000 cu. yd. per mile, with an eight-tenths per cent maximum grade, and a 3 deg. maximum curve. A sub-station will be built at Brushy, Iowa. The work is progressing rapidly, about 25 per cent of the grading, 40 per cent of the bridging and 15 per cent of the overhead line already has been completed. R. L. Cooper, chief engineer, Boone, Iowa, has active supervision of the work.

GULF, PLAINVILLE & NORTHERN.—The Imperial Promotion & Construction Company, of which Hal W. Neiswanger, Osborne, Kan., is president, has purchased the above road with all of its rights of way and 17 miles of railway grade. This road was begun some years ago, but owing to the failure of the construction company backing it at that time, just after it had the grade completed and was ready to lay the rails, the proposition was abandoned. However, other interested parties kept the enterprise alive by paying the taxes, hoping that some other promoters would take hold and put the road through. This is now about to be accomplished by the above-mentioned concern.

Actual track-laying will commence about November 1, and will be carried on to completion without further interruption. This road will run from Holyrood, Kan., down through Ellsworth county, north and west through Barton, Kan., thence north and west to Hays, Kan., so that connection with other and more important lines will be immediate. It is expected that the road will be ready for operation by April 1, 1917, at which time rolling stock and other equipment will be purchased. E. A. McFarland, Lincoln, Kan., has been elected president.

GULF & SHIP ISLAND.—Surveys for a proposed branch are to be made, it is said, from a point near Gulfport, Miss., west to Kiln, about 20 miles.

MARENGO, LAKE GENEVA & NORTHERN.—The Cortlandt Engineering Company of New York has been awarded a contract by the above road for the completion of its line from Marengo, Wis., to Delavan, Wis. A \$700,000 bond issue has been taken by the contractors.

MOBILE & BALDWIN COUNTY.—See Mobile, Volanta & Pensacola.

MOBILE, VOLANTA & PENSACOLA (ELECTRIC).—This company, formerly the Mobile & Baldwin County, which now operates an electric line from Volanta, Ala., south to Euclid, about four miles, proposes to build an extension east to Pensacola, Fla., about 40 miles. The company plans to issue \$100,000 bonds, it is said, to secure funds for carrying out the work.

MONTGOMERY LIGHT & TRACTION COMPANY.—This company will build an electric line from Montgomery, Ala., to Wetumpka, about 15 miles, it is said, if a bridge is built across the Tallapoosa river near Hughes' Ferry and permission is granted to operate electric cars over the bridge. The proposed line would cost about \$100,000.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has given a contract to Kaufman & Garcey, New York, at \$103,680 for the installation of tracks on the main portion of the Culver Rapid Transit Railroad in the borough of Brooklyn.

The commission has approved the award by the Interborough Rapid Transit Company to the Thomas Crimmins Contracting Company, New York City, of the contract for the installation of the third-rail on the Queens rapid transit lines. The cost of the work will be about \$22,300.

The commission has approved the award of the contract for the installation of the tracks on the Seventh avenue branch of the Lexington avenue line to Engel & Hevenor, New York, at \$229,440. This contract covers track laying from the junction of the Seventh avenue line with the first subway at Times Square, and south to a connection with the present subway at the Battery, and also in the Brooklyn extension of the Seventh avenue line to a connection with the first subway near Joralemon street.

The commission has awarded a contract to the Degnon Contracting Company, at \$810,265, for the construction of section 1-B of route 12. This is part of the connection between the Brighton Beach line and the Fourth avenue subway. This section extends from Atlantic avenue under the Flatbush avenue station of the Long Island Railroad to Hanson Place and St. Felix street in the borough of Brooklyn.

PENNSYLVANIA LINES WEST.—This company's construction forces are rebuilding two miles of the Wellsburg & State Line Railroad. The work includes some grading, new ties and 307 lineal feet of bridge superstructure.

SOUTHERN PACIFIC.—The report of this company for the year ended June 30, 1916, shows that on the Colusa & Hamilton, building from Hamilton, Cal. to Harrington, 61.23 miles, track laying has been completed on 46.66 miles, grading has been completed on 12 miles and is now under way on 2.56 miles. The Southern Pacific line, building from Eugene, Ore., to Marshfield, 120.50 miles, has 6.37 miles in operation, and track laying has been completed on 113.81 miles.

SUDBURY COPPER CLIFF ELECTRIC RAILWAY.—Plans for building an extension from Sudbury, Ont., to Murray nickel mine, about 4 miles, also a line from Sudbury to Coniston, about 19

miles are said to be under consideration. J. H. Mackey, president, Sudbury.

SUGAR LAND RAILWAY.—An extension of this road from Otey, Tex., south to Anchor, is reported open for business. (April 7, p. 818.)

WAYNE-HARDIN.—Surveys are now being made, and as soon as these are completed bids will be asked for building from Waynesboro, Tenn., south to Collinwood, where connection is to be made with the Tennessee Western, thence west to Savannah; in all about 45 miles. There will be one short steel bridge on the line. The promoters expect to develop a traffic in lumber, iron ore and agricultural products. E. H. Steinman, president, Collinwood. (February 25, p. 377.)

WEST VIRGINIA ROADS.—According to press reports from Clay, W. Va., the Hartland Colliery Company will build a 22-mile railway to develop coal lands in West Virginia. The line will connect with both the Chesapeake & Ohio and the Coal & Coke. John B. Hart, Clarksburg, president, W. Va., and M. McD. Price, general manager, Johnstown, Pa.

According to press reports from Omar, W. Va., the Main Island Coal Company is receiving bids for the construction of a three-mile railroad to be built to new mines.

RAILWAY STRUCTURES

ASHLAND, WIS.—The Chicago & North Western has let contracts to the Grant Smith Company of St. Paul, Minn., for the erection here of ore dock No. 3. This third dock will have 200 pockets, will be of 50,000 tons capacity and cost approximately \$1,500,000.

BON AIR, VA.—The Southern Railway will build a new passenger station at Bon Air. The building will be of frame construction, 26 ft. by 70 ft. with white and colored waiting rooms, office and baggage rooms, ladies' parlor, and will be equipped with modern conveniences. The improvements also include the rearrangement of the main line and side tracks, a short platform with concrete curb, a concrete wall supporting a driveway, steps and railing.

BUFFALO, N. Y.—The Pennsylvania Railroad will build a new outbound freight house at Buffalo. It will have standing room for 120 cars, and will be so constructed that, if necessary, it can be enlarged at some future time. Contracts for the work have not yet been let. The company will use the present freight station at Louisiana street for the inbound freight house.

BUTTE, MONT.—The report of the Chicago, Milwaukee & St. Paul for the year ended June 30, 1916, shows that the new passenger station under construction at Butte is about 50 per cent completed. The cost of this improvement will be about \$150,000. A new engine terminal with a 22 stall roundhouse to be built at North McGregor, Iowa, has been authorized. Land is being secured for new engine terminals at Sioux City, Iowa, also at Atkins. Work is under way on the new engine terminal with a 4 stall roundhouse at Beloit, Wis., and the enlargement of the roundhouse machine shop at Deer Lodge, Mont., in connection with the operation of electric locomotives is under construction at a cost of about \$21,000. The construction of 21 grain tanks of a total capacity of 625,000 bu. in connection with the company's elevator E at Milwaukee, Wis., has been authorized. An extension of the yard track facilities at Cedar Rapids, Iowa, is under construction at a cost of \$60,000 and is expected to be finished during 1916. Plans are under consideration for a proposed new passenger station and a duplication of the present ocean dock and warehouse at Tacoma, Wash.; automatic fire sprinkler and certain devices are being installed in the present dock and warehouse at a cost of \$25,000 and dredging work near the present dock and warehouse has been authorized at a cost of \$23,400.

DUBUQUE, IOWA.—The Illinois Central is remodeling and adding another story to its freight house at this point at an approximate cost of about \$20,000.

EAST ST. LOUIS, ILL.—The Illinois Central is erecting a new freight house here. The building will be of timber construction, 1,050 ft. long, 32 ft. wide and one story high. About 486 ft. will be two stories high to provide for additional office space. There will be a transfer platform 12 ft. wide and running the

entire length of the shed; also a heavy freight platform 170 ft. long and 27 ft. wide. The approximate cost of this undertaking is \$150,000.

FREEDPORT, ILL.—The Illinois Central is putting on an additional story to its division office building here at a cost of \$20,000. Work has just begun.

LOUISVILLE, KY.—Contracts have been awarded by the Illinois Central for a roundhouse and machine shop to cost approximately \$80,000.

NEW YORK.—The Pennsylvania Railroad is carrying out work at the Pennsylvania Terminal to provide facilities for connecting with the Seventh avenue subway.

The New York Public Service Commission, First district, will receive bids on October 6 for the construction of station finish for six stations in the borough of Manhattan on the rapid transit railroads now being constructed under the dual contracts, as follows: On the Lexington avenue line underneath Forty-second street beneath Park and Lexington avenues; on the upper portion of the Seventh avenue line at Forty-second street and Times Square, at Pennsylvania station (Thirty-third street), at Twenty-eighth street and at Eighteenth street.

A contract has been awarded by the commission to the Serber-Stander Company, New York, at \$149,324, for station finish work on the Canal, Twenty-third and Twenty-eighth street stations of the Broadway-Fourth avenue subway, in the borough of Manhattan.

PARKERSBURG, W. VA.—The Baltimore & Ohio has given a contract to J. J. Walsh & Sons, Baltimore, Md., at \$300,000, for the new freight facilities to be built at Parkersburg. (June 16, p. 1354.)

PINE BLUFF, ARK.—The St. Louis Southwestern has started work here on a new 15-stall roundhouse. The approximate cost will be close to \$30,000. All the work will be done by the company's own forces. J. S. Berry, superintendent of bridges and buildings, has direct supervision of the undertaking.

SPENCER, N. C.—Enlarged facilities for repairing cars at Spencer will be constructed at once by the Southern Railway to consist of a new all steel car shed 109 ft. by 600 ft. with a shop adjoining 50 ft. by 100 ft. Bids are now being asked for the foundation work. The shed will be equipped with overhead cranes for handling car bodies and materials. Additional track room will be provided for handling the increased number of cars to be repaired.

TECUMSEH, NEBR.—The Chicago, Burlington & Quincy will soon erect a new passenger station at this point. The building will be one story in height, of brick veneer material and cost close to \$25,000.

WATERLOO, IOWA.—The Waterloo, Cedar Falls & Northern has started excavation here for a structure to be used as general offices and interurban railway waiting-room. The building will be 85 ft. long, 80 ft. wide and three stories high. It will be of brick construction with wood floors. The approximate cost is \$75,000; H. A. Maine & Company of Waterloo, Iowa, being the successful bidders.

WEST DULUTH, MINN.—The company forces of the Northern Pacific are constructing an eight-stall roundhouse at this point on its property just west of Sixty-fifth avenue west. The building will be used for the present, at least, exclusively for housing switch engines used in this end of the city. It is expected that the new structure will be ready for occupancy by November 1, 1916. The building will be erected of timber, and be spacious enough to easily house the largest type of switch engines on the company's transfer lines.

IRISH RAILWAY TRAFFIC RECEIPTS.—The Irish Department of Agriculture has issued its report for the year 1915. It states that the gross traffic receipts of Irish railways amounted to \$23,510,063 in 1915, as compared with \$22,682,757 in 1914, \$22,551,361 in 1913, \$21,193,608 in 1912, and \$21,183,875 in 1911. In each of the first 25 weeks of 1915—that is, up to June 25—the gross receipts were greater than in 1914, but in 13 of the last 27 weeks of the year the receipts were less than in the corresponding weeks of 1914, due chiefly to the very large exports of live stock in the second half of 1914.

Railway Financial News

BOSTON & MAINE.—At the annual meeting of the stockholders of the Connecticut River Railroad, held at Springfield, Mass., September 21, the directors elected were those on the ticket headed by Richard Billings, and it is believed that the new board will be favorable to the plan of reorganization of the Boston & Maine, under which the Connecticut River would become an integral part of the Boston & Maine. Mr. Billings cast 19,000 of the 24,000 votes. The new directors are: J. H. Williams, Walpole, N. H.; Henry P. Binney, Boston; Francis R. Hart, Boston; William H. Brooks, Holyoke. The directors who retire are H. W. Keyes, E. P. Kendrick, Richard Olney and Charles E. Gross. The remaining members, including the president, William H. McClintock, were re-elected without opposition.

CHICAGO & EASTERN ILLINOIS.—William J. Jackson, receiver, has reported to the court that surplus funds available on September 1, amounted to \$1,476,960, against which there were liabilities of \$350,000; and on this report the court has authorized the payment of interest on bonds which has remained unpaid since March 25, 1915; a total amount of about \$630,000.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—At the annual meeting of the stockholders in Indianapolis, September 20, the Chicago & Wabash Valley, the Indiana Stone, and the Indianapolis & Louisville railroads were discontinued as separate corporations, all of the stock being owned by the Chicago, Indianapolis & Louisville.

COLORADO & SOUTHERN.—The directors, at a meeting held on September 22, declared a dividend of 2 per cent on the first preferred stock, the first dividend on this stock since October, 1913.

GRAND TRUNK.—The directors, at a meeting in London, September 22, declared a dividend of 2½ per cent on the first preferred five per cent stock. This is for the last half year. The last preceding dividend on these shares was paid in April, 1914.

WHEELING & LAKE ERIE.—The property of this road is advertised to be sold at foreclosure sale, October 30; and the upset price has been reduced to \$12,000,000. Kuhn, Loeb & Company and Blair & Company, reorganization managers, have announced a plan of reorganization which provides for a total capital of \$72,370,858; and for an assessment of \$27 a share on all classes of the present stock. The assessment is calculated to raise about ten millions, which will pay off \$6,673,000 in receivers' certificates, pay the cost of reorganization, and provide some working capital. According to the plan the annual interest charges will be reduced from \$1,744,950 to \$768,515. There will be a refunding mortgage under which \$50,000,000 in bonds will be authorized. Of these bonds, \$11,697,000 will be exchanged for the present first consolidated 4 per cent bonds. There will be \$11,882,600 7 per cent prior lien stock, which will be exchanged for the same par value of three-year notes now outstanding. Upon payment of the assessment, holders of the \$4,989,000 first preferred stock will get 100 per cent of new common and 27 per cent of new 6 per cent preferred. Owners of the second preferred will receive 90 per cent in common and 27 per cent in preferred, and holders of the \$20,000,000 old common 87½ per cent of new common and 27 per cent of preferred.

Divisional bonds and certain receiver's certificates amounting to \$4,805,000 will be left undisturbed. Holders of the three-year notes have accepted the plan, and its cash requirements have been underwritten by a syndicate headed by the reorganization managers. Stockholders and bondholders are asked to deposit their securities with the Central Trust Company, New York, before October 25.

LUXEMBURG TO MINT ZINC COINS.—The *Tägliche Rundschau* of Berlin states that the Government of Luxembourg has decided to mint 200,000 francs in small coins from zinc, owing to the lack of copper change.

ANNUAL REPORTS

SOUTHERN PACIFIC COMPANY REPORT OF THE BOARD OF DIRECTORS

New York, September 18, 1916.

TO THE STOCKHOLDERS OF THE SOUTHERN PACIFIC COMPANY:

Your Board of Directors submits this report of the operations of the Southern Pacific Company and of its Proprietary Companies for the fiscal year ended June 30, 1916.

PROPERTIES AND MILEAGE.

The transportation lines constituting the Southern Pacific System, June 30, 1916, were as follows:

DIVISIONS.	FIRST MAIN TRACK.	ADDITIONAL MAIN TRACK.	SIDINGS.	FER- RIES.	WATER LINES.
A.—MILEAGE OF LINES BELONGING TO OR LEASED BY COMPANIES THE CAPITAL STOCKS OF WHICH ARE PRINCIPALLY OWNED BY THE SOUTHERN PACIFIC COMPANY.					
(1)—Operated by the Southern Pacific Company under leases:					
Central Pacific Ry.....	2,267.82	256.29	878.51	9.90	125
Oregon & California R. R....	1,101.10	5.81	248.98		
Southern Pacific R. R.....	3,489.80	208.29	1,525.32	3.00	
South Pacific Coast Ry.....	106.69	20.46	49.93	3.00	
(2)—Operated by the owning Companies:					
Morgan's Louisiana & Texas R. R. & S. S. Co.....	400.67	58.35	228.73	3.00	
Louisiana Western R. R.....	207.74	....	70.26		
Lake Charles & Northern R. R.	71.52	....	12.20		
Texas & New Orleans R. R.	468.14	3.46	208.95		
Galveston, Harrisburg & San Antonio Ry.....	1,360.95	6.59	345.26		
Houston, East & West Texas Ry.....	190.94	....	57.47		
Houston & Shreveport R. R....	40.72	.69	7.28		
Houston & Texas Central R. R.	894.63	1.65	260.21		
Southern Pacific Terminal Company.....	....	....	25.68		
Arizona Eastern R. R.....	377.74	....	72.67		
Southern Pacific Company....	....	....	....	4.400	
B.—MILEAGE OF LINES BELONGING TO COMPANIES THE CAPITAL STOCKS OF WHICH ARE PRINCIPALLY OWNED BY THE MORGAN'S LOUISIANA & TEXAS R. R. & S. S. CO., BUT WHICH ARE OPERATED BY THE OWNING COMPANIES.					
Iberia & Vermilion R. R.....	21.44	....	10.93		
Direct Navigation Co.....	....	....	....	....	65
Total.....	10,999.90	561.59	4,002.38	18.90	4,590
Less operated jointly by Proprietary Co's.....	43.41	9.97	20.31		
Total miles of road operated June 30, 1916.....	10,956.49	551.62	3,982.07	18.90	4,590
June 30, 1915.....	10,587.40	551.50	3,838.05	18.90	4,873
Increase.....	369.09	.12	144.02		
Decrease.....	....	....	....	....	283

In addition to the mileage above tabulated, the Southern Pacific Company solely controls through ownership of capital stock, 780.01 miles of electric lines, and 1,242.42 miles of the Southern Pacific R. R. Co. of Mexico; and jointly controls (through ownership of capital stock in equal proportions with the Atchison, Topeka & Santa Fe Ry. Co.) 506.77 miles of the Northwestern Pacific Railroad, and 62.93 miles of the Sunset Railway, an aggregate of 13,548.62 miles.

On July 1, 1915, the Southern Pacific Company purchased the properties of the following affiliated companies, which properties are operated in connection with the property of the Oregon & California R. R. Co.:

Coos Bay, Roseburg & Eastern R. R. & Nav. Co.....	27.77 miles
Pacific Railway & Navigation Co.....	91.16 "
Salem, Falls City & Western Ry. Co.....	28.17 "
Corvallis & Eastern R. R. Co.....	140.58 "
Portland, Eugene & Eastern Ry. Co.....	107.76 "
Willamette Pacific R. R. Co.....	73.39 "

Total miles of road purchased..... 468.83 "

Less—Mileage of Willamette Pacific R. R. Co. not in operation July 1, 1915..... 67.02 "

Miles of road in operation July 1, 1915..... 401.81 miles

On July 1, 1915, the Lake Charles & Northern R. R. Co., which operates 70.50 miles of road, and which had not before been dealt with as a Proprietary Company, was taken into the system, and its assets and liabilities and the results of its operations are included in the exhibits of Proprietary Companies in this report.

INCOME ACCOUNT.

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES, COMBINED.

(Excluding offsetting accounts.)

	This Year.	Last Year.	—Decrease. + Increase.	Cent. Per
Average miles of road operated:				
Lines East of El Paso.....	3,636.14	3,534.12	+	102.02 2.89
Lines West of El Paso.....	7,319.83	7,020.12	+	299.71 4.27
	10,955.97	10,554.24	+	401.73 3.81

	This Year.	Last Year.	+ Increase. — Decrease.	Per Cent.
OPERATING INCOME.				
Railway operating revenues.....	\$152,694,228.19	\$129,865,675.09	+\$22,828,553.10	17.58
Railway operating expenses.....	97,443,658.23	87,753,842.31	+ 9,689,815.92	11.04
Net revenue from railway operations.....	\$55,250,569.96	\$42,111,832.78	+\$13,138,737.18	31.20
Railway tax accruals.....	\$7,023,325.97	\$6,371,272.84	+ \$652,053.13	10.23
Uncollectible railway revenues.....	37,272.95	50,946.14	— 13,673.19	26.84
Total operating income.....	\$48,189,971.04	\$35,689,613.80	+\$12,500,357.24	35.03
NONOPERATING INCOME.				
Rent from locomotives.....	\$54,945.04	\$72,612.74	— \$17,667.70	24.33
Rent from passenger train cars.....	324,624.94	282,448.41	+ 42,176.53	14.93
Rent from floating equipment.....	50,347.10	80,759.03	— 30,411.93	37.66
Rent from work equipment.....	42,574.07	69,555.19	— 26,981.12	38.79
Joint facility rent income.....	266,069.21	473,475.01	— 207,405.80	43.81
Income from lease of road.....	43,085.38	94,996.46	— 51,911.08	54.65
Miscellaneous rent income.....	549,774.17	444,514.74	+ 105,259.43	23.68
Miscellaneous non-operating physical property.....	276,310.31	298,358.19	— 22,047.88	7.39
Dividend income.....	4,418,154.07	4,478,250.00	— 60,095.93	1.34
Income from funded securities — Bonds and notes — Affiliated and other companies.....	3,799,634.93	3,756,061.84	+ 43,573.09	1.16
Income from funded securities — Investment advances — Affiliated companies.....	1,015,819.55	2,157,327.50	— 1,141,507.95	52.91
Income from unfunded securities and accounts.....	584,829.75	494,136.41	+ 90,693.34	18.35
Income from sinking and other reserve funds.....	653,787.86	678,550.66	— 24,762.80	3.65
Miscellaneous income.....	123,078.85	577,332.14	— 454,253.29	78.68
Total nonoperating income.....	\$12,203,035.23	\$13,958,378.32	— \$1,755,343.09	12.58
Gross income.....	\$60,393,006.27	\$49,647,992.12	+\$10,745,014.15	21.64
DEDUCTIONS FROM GROSS INCOME.				
Hire of freight cars — Debit balance.....	\$405,599.93	\$120,850.99	+ \$284,748.94	235.62
Rent for locomotives.....	24,399.00	24,771.52	— 372.52	1.50
Rent for passenger train cars.....	249,240.14	172,921.37	+ 76,318.77	44.13
Rent for floating equipment.....	255,883.16	3,613.92	+ 252,269.24	....
Rent for work equipment.....	6,583.89	6,960.69	— 376.80	5.41
Joint facility rents.....	361,527.34	358,839.75	+ 2,687.59	.75
Rent for leased roads.....	736,465.40	717,904.21	+ 18,561.19	2.59
Miscellaneous rents.....	669,373.22	647,940.60	+ 21,432.62	3.31
Miscellaneous tax accruals.....	1,280,390.95	965,387.10	+ 315,003.85	32.63
Interest on funded debt — Bonds and notes.....	24,663,251.94	25,105,848.89	— 442,596.95	1.76
Interest on funded debt — Nonnegotiable debt to Affiliated Companies.....	267,290.07	275,536.69	— 8,246.62	2.99
Interest on unfunded debt.....	31,518.20	81,037.38	— 49,519.18	61.11
Amortization of discount on funded debt.....	225,343.53	237,540.56	— 12,197.03	5.13
Maintenance of investment organization.....	142,410.77	125,981.31	+ 16,429.46	13.04
Miscellaneous income charges.....	188,474.82	232,537.67	— 44,062.85	18.95
Total deductions from gross income.....	\$29,507,752.36	\$29,077,672.65	+ \$430,079.71	1.48
Net income.....	\$30,885,253.91	\$20,570,319.47	+\$10,314,934.44	50.14
DISPOSITION OF NET INCOME.				
Income applied to sinking and other reserve funds.....	\$934,837.82	\$939,724.57	— \$4,886.75	.52
Income balance transferred to credit of Profit and Loss.....	\$29,950,416.09	\$19,630,594.90	+\$10,319,821.19	52.57

	This Year.	Last Year.	+ Increase. — Decrease.	Per Cent.
Per cent. on out- standing capital stock of Southern Pacific Company..	10.98	7.20	+ 3.78	52.50

In the foregoing table there has been excluded from both sides of the account (Income from Funded Securities, and Interest on Funded Debt) for this year and last, the interest paid and received on bonds of Proprietary Companies owned by Southern Pacific Company and its Proprietary Companies.

The Interstate Commerce Commission, during the year, issued a ruling to the effect that interest on investment advances to affiliated companies, which we have heretofore dealt with as Income from Unfunded Securities and Accounts, should be classified as Income from Funded Securities. In the figures for last year in the foregoing statement the sum of \$2,157,327.50, which was included in the \$2,651,463.91 reported last year as Income from Unfunded Securities and Accounts, is shown as Income from Funded Securities—Investment Advances—Affiliated Companies.

The details of Railway Operating Revenues and Railway Operating Expenses are fully dealt with under Transportation Operations.

The payments during the year to other companies for rent of equipment exceed the income from rent of equipment by \$469,214.97, an increase, as compared with last year, of \$645,471.85, of which \$362,790.68 is on account of rolling stock, and \$282,681.17 is on account of floating equipment.

The decrease of \$207,405.80 in Joint Facility Rent Income is the result, principally, of charging against the said account this year the estimated amount of depreciation on certain terminal facilities included in said account in previous years, in order to provide a reserve for the replacement of such facilities.

The decrease of \$51,911.08 in Income from Lease of Road is the result, principally, of the termination of the lease to the Butte County Railroad of the branch line from Barber to Stirling City.

The principal cause of the increase in Miscellaneous Rent Income was the collection during the current year of \$85,278.55 of rentals which accrued prior to July 1, 1915.

The decrease in Miscellaneous Nonoperating Physical Property is due, principally, to a decrease in the interest on notes received in payment for lands covered by Central Pacific Railway Company Three and One-half Per Cent. Mortgage, resulting from a decrease in the principal of such notes.

The decrease in Income from Funded Securities—Investment Advances—Affiliated Companies is the result principally, of including in the said account last year interest accruing prior to July 1, 1914, on construction advances to affiliated companies; and interest accruing last year on construction advances the principal of which was repaid last year.

The increase in Income from Unfunded Securities and Accounts is the result of including in the said account this year, in accordance with a ruling of the Interstate Commerce Commission, interest on the Companies' own funds used for construction, which was last year included in Miscellaneous Income; and of a decrease in the amount of interest received on bank balances, due to the application of current funds to the purchase of bonds issued under Central Pacific Railway Company Four Per Cent. Thirty-Five Year European Loan of 1911.

The decrease in Miscellaneous Income is the result of taking into last year's income the net receipts from the operations of the steamships Persia and Nile from July 1, 1913, to June 30, 1915; and to the inclusion in the said account last year of interest on the Companies' own funds used for construction, which is this year included in Income from Unfunded Securities and Accounts as explained in the preceding paragraph.

The increase in Miscellaneous Tax Accruals is the result of the assessment by the Government of additional income tax, aggregating \$325,179.33, covering the twelve months ended December 31, 1913, and the six months ended June 30, 1914. This tax was paid under protest and suit has been brought for its recovery.

The decrease in Interest on Funded Debt—Bonds and Notes is the result, principally, of the acquisition by the Southern Pacific Company during the year of approximately \$21,925,000, par value, of bonds issued under Central Pacific Railway Company Four Per Cent. Thirty-five Year European Loan of 1911, the interest on which, amounting to \$443,129.83, has been excluded, in the foregoing statement, both from Interest on Funded Debt and from Income from Funded Securities.

The amounts reported against Maintenance of Investment Organization represent expenses of the Southern Pacific Company for other than railway operations, and the expenses of keeping up the corporate organizations of the Proprietary Companies, the properties of which are operated by the Southern Pacific Company under leases.

On June 30, 1916, the principal of advances to the Southern Pacific Railroad Company of Mexico amounted to \$40,048,950.57. Interest accruing on these advances has not been taken into the income of the Southern Pacific Company.

CAPITAL STOCK.

The capital stock of the Southern Pacific Company outstanding at the beginning of the year amounted to.....\$272,674,405.64

Issued during the year:

Common stock issued in exchange for a like amount of
Five Per Cent. Twenty-Year Convertible Gold Bonds
surrendered and cancelled..... 3,500.00

Amount of Southern Pacific Company stock outstanding
June 30, 1916.....\$272,677,905.64

Capital stocks of Proprietary Companies outstanding as
shown by last year's report, viz.:

Preferred stock \$29,400,000.00
Common stock \$315,800,572.00

Add:

Capital stock of the Lake
Charles & Northern R. R.
Co. which has not hereto-
fore been dealt with as a
"Proprietary Company" ..\$95,000.00

Adjustment of difference be-
tween amount of Galveston,
Harrisburg & San Antonio
Ry. Co. capital stock actually
outstanding and the amount
heretofore reported 28.00

95,028.00
\$315,895,600.00

Deduct:

Capital stock of the Corvallis & Eastern
Railroad Company, which Company
was dissolved following the sale of
its property, on July 1, 1915, to the
Southern Pacific Company..... 1,410,000.00
314,485,600.00

Total stocks of Proprietary Companies outstanding June
30, 1916\$343,885,600.00

Stocks of Proprietary Companies outstanding June 30,
1916, were held as follows:
Owned by Southern Pacific Company.....\$343,452,400.00
Owned by Morgan's Louisiana & Texas Railroad &
Steamship Company 350,000.00
In the hands of the Public..... 83,200.00
\$343,885,600.00

FUNDED DEBT.

The funded and other fixed interest bearing debt of the Southern Pacific Company and of its Proprietary Companies outstanding June 30, 1915, was as follows:

Southern Pacific Company.....\$206,175,910.00
Proprietary Companies 456,989,256.44
Total outstanding June 30, 1915.....\$663,165,166.44

Deduct:

Funded debt of the Corvallis & Eastern Railroad Company,
all of which is owned by the Southern Pacific Company,
and which was assumed by the latter Company upon the
purchase by it of the property of the former Company
on July 1, 1915..... 2,115,000.00
Retired during the year:

SOUTHERN PACIFIC COMPANY.

San Francisco Terminal First Mortgage
Four Per Cent. Bonds:
Purchased from payments to sinking fund. \$6,800.00
Five Per Cent. Twenty-Year Con-
vertible Gold Bonds:
Retired in exchange for a like
amount of common stock issued \$3,500.00
Adjustment account of forfeiture
of unpaid subscriptions..... 500.00
4,000.00
Equipment Trust Certificates, Series A, due
March 1, 1916, paid off..... 1,012,000.00
Equipment Trust Certificates, Series B, due
September 1, 1915, paid off..... 201,000.00
Equipment Trust Certificates, Series C, due
December 1, 1915, paid off..... 117,000.00
\$1,340,800.00

CENTRAL PACIFIC RAILWAY COMPANY.

Three and One-Half Per Cent. Mortgage
Gold Bonds:
Purchased from pro-
ceeds of sale of
lands\$497,000.00
Purchased from pay-
ments to sinking
fund 23,500.00
\$520,500.00
First Refunding Mortgage Four
Per Cent. Bonds:
Purchased from payments to
sinking fund 27,000.00
547,500.00

HOUSTON & TEXAS CENTRAL RAIL-
ROAD COMPANY.

First Mortgage Five Per Cent.
Bonds:
Purchased from proceeds of
sales of lands..... \$22,000.00
Purchase Money Note due Sep-
tember 30, 1915, matured..... 50,000.00
72,000.00

SOUTH PACIFIC COAST RAILWAY COMPANY.

First Mortgage Four Per Cent. Bonds:
Purchased from payments to sinking fund. 196,000.00

SOUTHERN PACIFIC RAILROAD COMPANY.

First Refunding Mortgage Four Per Cent.
Gold Bonds:
Purchased from payments to sinking fund. 13,000.00

TEXAS & NEW ORLEANS RAILROAD COMPANY.

Payment to State of Texas on account of
School Fund Debt..... 5,244.31
2,174,544.31

Amount of funded and other fixed interest bearing debt of
the Southern Pacific Company and of its Proprietary Com-
panies, outstanding June 30, 1916.....\$658,875,622.13
Net decrease during the year (Other than \$2,115,000 bonds
of Corvallis & Eastern R. R. Co. assumed by Southern
Pacific Company as hereinbefore explained)..... \$2,174,544.31

The outstanding securities are held as follows:

In the hands of the public.....\$558,314,510.05
Owned by Southern Pacific Company..... \$86,903,112.08
Owned by Proprietary Companies..... 3,211,000.00
Held in Sinking Funds of Proprietary Com-
panies 10,447,000.00
100,561,112.08
Total\$658,875,622.13

ASSETS AND LIABILITIES.

The value of the granted lands belonging to the Central Pacific Railway Company and to the Oregon and California Railroad Company, remaining unsold at the close of the year, is not included in the following statement. The assets and liabilities of the Southern Pacific Company and of its Proprietary Companies, combined, on June 30, 1916, and the increases and decreases during the year, excluding the offsetting accounts between the Companies, summarized, were as follows:

	Total June 30, 1916.	Increase.	Decrease.
INVESTMENTS.			
Investment in road and equipment	\$939,971,725.25	\$31,259,481.79	
Sinking funds	12,599,816.58	638,013.03	
Deposits in lieu of mortgaged property sold	18,702.26	2,704.66	
Improvements on leased railway property	1,372,067.77		\$53,857.86
Miscellaneous physical property	17,444,677.25	289,526.65	
Investments in affiliated companies:			
Stocks and bonds	*435,301,609.22	4,561,850.75	
Notes and advances	91,032,155.01		20,143,036.31
Other investments:			
Stocks and bonds	7,182,457.30		724,850.00
Notes, advances and miscellaneous	7,525,750.52	687,195.47	
	\$1,512,448,961.16	\$16,517,028.18	
CURRENT AND DEFERRED ASSETS.			
Cash and demand loans and deposits	\$18,528,302.59	\$2,220,373.95	
Special deposits	92,599.35		\$448,570.15
Other cash accounts	12,781,242.38	1,951,613.15	
Material and supplies	16,609,507.87		2,250,371.53
Deferred assets	6,344,044.78	132,523.78	
	\$54,355,696.97	\$1,605,569.20	
UNADJUSTED DEBITS.			
Discount on capital stock	\$3,678,600.00		
Discount on funded debt	3,922,233.11		\$300,778.27
Other unadjusted debits	4,195,965.44		354,842.22
	\$11,796,798.55		\$655,620.49
Total assets	\$1,578,601,456.68	\$17,466,976.89	
STOCK.			
Capital stock of Southern Pacific Company	\$272,677,905.64	\$3,500.00	
Capital stock of Proprietary Companies	*343,885,600.00		\$1,314,972.00
	\$616,563,505.64		\$1,311,472.00
LONG TERM DEBT.			
Funded debt of Southern Pacific Company	\$204,835,110.00		\$1,340,800.00
Funded debt of Proprietary Companies	*454,040,512.13		2,948,744.31
	\$658,875,622.13		\$4,289,544.31
Nonnegotiable debt to affiliated companies	\$7,346,817.56	\$1,262,867.64	
	\$666,222,439.69		\$3,026,676.67
CURRENT AND DEFERRED LIABILITIES			
Audited accounts and wages payable	\$8,557,492.53	\$864,701.46	
Interest and dividends matured unpaid	8,893,060.66	340,128.42	
Unmatured dividends declared	4,090,168.58	52.50	
Unmatured interest accrued	5,452,044.00		\$20,731.07
Other cash accounts	3,180,810.73	532,800.07	
Deferred liabilities	244,127.33		151,377.64
	\$30,417,703.83	\$1,565,573.74	
UNADJUSTED CREDITS.			
Accrued depreciation	\$36,994,402.85	\$850,175.14	
Other unadjusted credits	†36,269,774.64	4,651,946.19	
	\$73,264,177.49	\$5,502,121.33	
Total liabilities	\$1,386,467,826.65	\$2,729,546.40	
CORPORATE SURPLUS.			
Appropriated surplus	\$32,355,136.52	\$1,710,664.32	
Profit and loss	159,778,493.51	13,026,766.17	
Total corporate surplus	\$192,133,630.03	\$14,737,430.49	
Total	\$1,578,601,456.68	\$17,466,976.89	

*The outstanding capital stock and funded debt include capital stocks and funded debt of Proprietary Companies of the par value of \$343,802,400 and \$100,561,112.08, respectively, a total of \$444,363,512.08, which securities are owned by the Southern Pacific Company or by Proprietary Companies, or are held in sinking funds of Proprietary Companies. The cost of these securities is included in the investments shown above. Of the said amount, stocks of the par value of \$249,653,161, which stand charged on the books at \$232,932,667.41, are pledged against the issue of Southern Pacific Company stock and bonds. †Represents, principally, interest on construction advances which have not been repaid. ‡Includes \$2,115,000 bonds of the Corvallis & Eastern R. R. Co., assumed by Southern Pacific Company as hereinbefore explained.

TRANSPORTATION OPERATIONS.

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES, COMBINED.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles of road operated	10,955.97	10,554.24	401.73	3.81
RAILWAY OPERATING REVENUES.				
Freight	\$98,567,886.39	\$80,020,751.38	\$18,547,135.01	23.18
Passenger	40,338,316.29	36,864,997.50	3,473,318.79	9.42
Mail and express	6,156,770.29	5,922,171.25	234,599.04	3.96
All other transportation	3,031,345.67	3,055,134.36	—23,788.69	.78
Incidental	4,550,621.97	3,941,910.42	608,711.55	15.44
Joint facility—Credit ..	70,983.93	76,942.58	—5,958.65	7.74
Joint facility—Debit ..	21,496.35	16,232.40	—5,463.95	33.66
Total	\$152,694,228.19	\$129,865,675.09	\$22,828,553.10	17.58
RAILWAY OPERATING EXPENSES.				
Maintenance of way and structures	\$18,367,137.29	\$15,356,355.77	\$3,010,781.52	19.61
Maintenance of equipment	21,866,636.02	19,815,973.36	2,050,662.66	10.35
Total maintenance	\$40,233,773.31	\$35,172,329.13	\$5,061,444.18	14.39
Traffic	\$3,131,404.18	\$2,915,009.84	\$216,394.34	7.42
Transportation	48,027,904.17	44,006,753.11	4,021,151.06	9.14
Miscellaneous operations	2,438,348.43	2,031,856.61	406,491.82	20.01
General	3,913,399.45	3,955,027.24	—41,627.79	1.05
Transportation for investment—Credit ..	301,171.31	327,133.62	—25,962.31	7.94
Total	\$97,443,658.23	\$87,753,842.31	\$9,689,815.92	11.04
Net revenue from railway operations	\$55,250,569.96	\$42,111,832.78	\$13,138,737.18	31.20
Railway tax accruals ..	\$7,023,325.97	\$6,371,272.84	\$652,053.13	10.23
Uncollectible railway revenues	37,272.95	50,946.14	—13,673.19	26.84
Total operating income	\$48,189,971.04	\$35,689,613.80	\$12,500,357.24	35.03
FREIGHT TRAFFIC.				
Tons—revenue freight —total	37,322,383	31,857,039	5,465,344	17.16
Ton miles—revenue freight—total	9,211,615,334	6,637,345,295	2,574,270,039	38.78
Average ton miles per train mile— all freight	526.30	463.71	62.59	13.50
Average loaded freight car miles per train mile	22.99	22.32	.67	3.00
Average ton miles per loaded freight car mile—all freight ..	22.89	20.78	2.11	10.15
Percentage of loaded freight car miles to total	71.76	69.84	1.92	2.75
Average freight revenue per train mile ..	\$4.52	\$4.39	\$0.13	2.96
Average revenue per ton mile of freight— revenue freight ..	.977 cents.	1.099 cents.	—.122 cents	11.10
Average miles hauled —revenue freight ..	246.81 miles.	208.35 miles.	38.46 miles.	18.46
PASSENGER TRAFFIC.				
Passengers carried — revenue — including ferry suburban ..	45,873,419	41,708,096	4,165,323	9.99
Passenger miles—revenue—including ferry suburban	1,914,189,495	1,662,556,191	251,633,304	15.14
Average passenger service train revenue per train mile	\$1.46	\$1.51	—\$0.05	3.31
Average revenue per passenger mile ..	2.069 cents.	2.173 cents.	—.104 cents	4.79
Average miles carried —revenue passengers —including ferry suburban	41.73 miles.	39.86 miles	1.87 miles.	4.69

The gross earnings during the year were \$152,694,228.19, which are the largest earnings in the history of the company. This showing surpasses the previous high record of 1913 by \$9,919,523.12, and is an increase over last year of \$22,828,553.10.

There has been no abatement of automobile competition for local passenger travel, but the losses sustained in that direction have been more than counterbalanced by the extraordinary travel which was stimulated by the California Expositions during the first five months of the fiscal year, by the movement of troops between points on the Mexican border, and by a general improvement in agricultural and commercial conditions along your company's lines. The earnings accruing under a new and more favorable contract with the Pullman Company, and the revenue derived from dining cars, hotels and restaurants, were substantially increased by the Exposition travel. The aggregate increase in gross earnings accruing from passenger fares, and from Pullman, dining car, hotel and restaurant business, was \$4,804,854.65, equivalent to 12.32 per cent.

The interruption of steamship service through the Panama Canal since September 18, 1915, has minimized sea competition, and has restored to your company's lines the freight which had been diverted from them by the frequent steamship service through the Panama Canal during the previous year, and by the low rates then prevailing. Nearly all the steamers which had operated through the Canal found more profitable employment in consequence of the increased demand for steamship tonnage owing to the European War, and they have not been restored to regular

service between Atlantic and Pacific ports since the reopening of the Canal. Upon the return of normal conditions, however, it may safely be assumed that the intense competition of the Canal steamship lines will be encountered again.

Mineral Products contributed an increase of \$5,082,812 in gross earnings, resulting from the unusual demand for copper created by the European War, and the consequent increased tonnage of ores and bullion from Arizona, Mexico, New Mexico, California and Nevada, and by a large movement of fuel consumed in the operation of the mines and smelters.

Agricultural Products brought an increase of \$2,319,641 in gross earnings, chiefly received from shipments of barley, rice, beans, dried fruit and other commodities, which shipments were restored to your company's lines after the discontinuance of service through the Panama Canal.

Forest Products yielded an increase in gross earnings of \$2,829,874, the lumber industry having benefited both by enlarged mining operations and by a general revival of business.

Manufactured Products have produced an increase in gross earnings of \$5,801,075, which has been chiefly received from shipments of automobiles and of such commodities as canned goods, iron and steel articles, and sugar, which shipments have been secured by your company's lines during the interruption of steamship service through the Canal.

General Merchandise and Miscellaneous Traffic enjoyed a recovery, which is largely attributable to the relief of the industries of the United States from the competition of foreign countries during the prosecution of the European War.

Of the total increase in gross earnings, \$856,429.60 accrued from Oregon lines, which were not operated as a part of the system prior to this year.

The increase of \$22,828,553.10, or 17.58 per cent., in Railway Operating Revenues, was earned with a decrease of 11.10 per cent. in the average revenue per ton mile of revenue freight, a decrease of 4.79 per cent. in the average revenue per passenger mile, and an increase of \$9,689,815.92, or 11.04 per cent., in Operating Expenses. After taking into account Railway Tax Accruals, which increased \$652,053.13, or 10.23 per cent., and Uncollectible Railway Revenues, Total Operating income increased \$12,500,357.24, or 35.03 per cent.

Of the total increase in Railway Operating Expenses, \$5,061,444.18, or 14.39 per cent., is allocated to maintenance, and \$4,628,371.74, or 8.80 per cent., to transportation and other expenses. The Company's standard of upkeep of its properties has been maintained, and the condition of the roadway has been substantially improved, by heavy renewals of rail with 90-pound sections. The percentage of equipment in repair tracks is normal, although the mileage run during the year shows a large increase. At the close of the year 15 per cent. fewer locomotives and 50 per cent. fewer freight cars awaited repairs than on the corresponding date last year.

Improvements in operating efficiency are shown in average car and train loads, in locomotive fuel consumption, and in the movement of freight cars.

Tons of freight per loaded car increased 2.11 tons to 22.89 tons, or 10.15 per cent.

The average of 526.30 tons of freight per train is the highest on record, being an increase over last year of 62.59 tons, or 13.50 per cent. This increase in train load effected a saving of 2,666,008 freight-train miles.

The greater efficiency in the use of locomotive fuel, shown in last year's operations, not only has been maintained but has been increased, 5.16 gross ton miles were moved per pound of fuel in passenger service, an increase of 2.18 per cent., and 5.93 gross ton miles in freight service, an increase of 2.42 per cent. The money value of this gain is \$217,396.08, compared with 1915; \$740,395.92, compared with 1914; and \$1,515,645.12, compared with 1913.

The average miles run per freight car per day was 34.96, compared with 27.65 last year, a gain of 26.44 per cent. The percentage of empty freight-car mileage decreased from 30.16 per cent. to 28.24 per cent.

Efforts to reduce payments for loss and damage to freight and to increase safety of operation, have been unremitting. A reduction in payments for loss and damage to freight of \$336,594.87, or 32.01 per cent., was effected, although an increase of 38.78 per cent. in revenue ton mileage was handled. These payments absorbed 1.442 per cent. of freight revenue in 1915 and only 0.795 per cent. in 1916.

If the demands, backed up with threats of a general strike, of the federated organizations of engineers, firemen, conductors and brakemen for over 25 per cent. increase in wages, now under discussion with their committees, are conceded, operating expenses of your Company's lines will be increased by about \$2,500,000 per annum, which will wipe out these substantial economies achieved by unremitting and strenuous work throughout the year.

In order to maintain the Company's credit, and to provide for the natural growth and development of its lines, such threatened increases of expense can be met in but one of two ways—by an increase of revenue, or by a reduction of expenses in other directions. Embarrassed on the one side by numerous ill-considered Federal and State laws, which largely and unnecessarily increase the cost of operation, and on the other by large increases in prices of supplies, your officers have little opportunity left to effect a material reduction in operating costs.

Comparative prices paid during the year, and in 1913 and 1914, for some of the principal items of materials and supplies, show increases as follows:

Pacific Type Passenger Locomotives.....	30%
10,000 gallon Locomotive Tenders.....	48%
12,500 gallon Tank Cars.....	28%
Plate Girder Bridges.....	97%
Rolled Beams.....	97%
Bar Iron.....	143%
Journal Bearings.....	99%
Rivets.....	134%
Barbed Wire.....	78%
Tie Plates.....	91%

As little or no more can be accomplished in the direction of reducing costs, efforts will have to be concentrated on raising revenues, and unless the present volume of traffic can be maintained or increased, we shall have to appeal for relief to the same public whose tolerance or tacit consent is responsible for the hardships we are enduring.

The following suggestion, which appeared in the report for 1914, with slight change, is considered timely:

"Your Board repeats the suggestion that you take an active part in repelling the attacks of demagogues on your property. Unfair treatment of railroads is due in great part to the belief of politicians that only financial magnates suffer therefrom. The surest remedy for the evil is for railroad investors to give unmistakable evidence of their numbers and of their resentment of unfair legislation or regulation. You now number over 33,000, and with the stockholders of other railroads and with investors in their securities you form a body of a million or more voters, whose protests, backed up by ballots, can lawfully exert sufficient force to compel fair treatment by your servants in Congress, in legislatures, and on commissions. The common interests of railroad shareholders and of investors in every community, no matter how small, should

cause them to actively participate in every election and to perform faithfully all other duties of citizenship, in order to secure proper representation and protection for their interests."

RAILWAY TAX ACCRUALS.

The net operating revenue for the fiscal year ended June 30, 1916, amounted to \$55,250,569.96, whereof \$7,023,325.97, OR A LITTLE MORE THAN ONE-EIGHTH, WAS PAID IN TAXES. With an increase of 187.93 per cent. in the mileage of all tracks operated during the life of the Company, taxes have increased \$6,163,820.91 or 717.14 per cent.

SAFETY OF OPERATION.

During the past year, no passenger lost his life in a train accident, and with but one exception, none has been killed in a train accident for SEVEN YEARS AND ELEVEN MONTHS, during which period 433,935,632 locomotive miles were run and 328,592,863 passengers were carried an average of 42.48 miles, or 13,959,745,239 passengers carried one mile. During

FATALITIES IN TRAIN ACCIDENTS						
Number Killed	1910	1911	1912	1913	1914	1915
50						
45						
40						
35						
30						
25						
20						
15						
10						
5						
0						
TOTAL KILLED	19	14	42	9	7	8
EMPLOYEES	0	0	0	0	1	0
PASSENGERS	19	14	42	9	6	8
TOTAL KILLED PER MILLION LOCOMOTIVE MILES	0.360	0.358	0.772	0.168	0.153	0.185
EMPLOYEES	0	0	0	0	0.018	0
PASSENGERS	0.360	0.358	0.772	0.168	0.153	0.185
Passengers Carried	40,190,300	89,989,058	40,328,911	42,006,340	42,744,873	41,708,098
Passengers Carried One Mile	1,800,934,593	1,800,132,503	1,787,540,035	1,834,200,082	1,768,982,090	1,861,556,191
Locomotive Mileage	54,457,917	54,227,433	54,417,530	57,653,935	57,054,584	52,127,703
Number Trains in Service	9,222	8,005	9,127	9,497	9,418	8,864

the year only 10 employees out of 9,892 lost their lives through train accidents in a movement of 60,702,513 locomotive miles. Out of 43,885 employees engaged in pursuits not involving train movements, 19 lost their lives—an average of one fatality in 7,695,599 work hours, or 2,300 years of 313 working days each.

THE SUIT INVOLVING THE RIGHT TO CONTROL THE CENTRAL PACIFIC RAILWAY COMPANY.

This case was fully argued in the lower court and submitted early in December, 1915. The Court has since had the case under advisement. A decision is looked for any day. An appeal will lie to the Supreme Court of the United States. In view of the importance of the case and the nature of the questions involved it may be expected that the losing party will take the case to the higher court.

THE SUITS INVOLVING TITLE TO THE OIL LANDS.

The last report contained the following statement:

"The Attorney-General of the United States, deeming it his duty not to abandon the pursuit of the Company's lands without a judicial investigation to determine whether or not our patents were fraudulently obtained, has renewed the litigation, specially alleging such fraud; and, in order to avoid the six years' period of limitation, it has been further alleged that the Government was prevented from suing within the required time, by fraudulent concealment of its acts by the Railroad Company. There has been no final decision in these suits. The fact that they have been instituted does not lessen the confidence expressed in the last annual report as to our ability to sustain our title to the lands in question."

The time which has since intervened has been occupied by the Government in the taking of testimony. It is believed that the cases will be ready for argument in the lower court early in 1917. Nothing has yet occurred to lessen our confidence in the final outcome.

CONTROVERSY OVER THE OREGON & CALIFORNIA RAILROAD'S LAND GRANT.

In the last report attention was called to the decision of the Supreme Court of the United States reversing the forfeiture decree of the court below and declaring that the title of the Railroad Company to the unsold lands had not been forfeited, but that the lands were held subject to the original terms of the grant limiting sales to actual settlers, in quantities not exceeding 160 acres to any one purchaser, and at prices not exceeding \$2.50 per acre. It was stated that the Supreme Court, recognizing that such restrictive covenants were not appropriate to lands of the character of those remaining unsold, had practically referred the matter to Congress by enjoining any disposition of the unsold lands or of the timber thereon "until Congress shall have a reasonable opportunity to provide by legislation for their disposition in accordance with such policy as it may deem fitting under the circumstances, and at the same time secure to the defendants all the value the granting acts conferred upon the railroads"; with the proviso that, if Congress did not act within six months, the Railroad Company might apply to the lower court for a modification of so much of the injunction as enjoined any disposition of the land or timber. It was further stated that the Railroad Company was prepared to co-operate with Congress in securing appropriate modification of the original restrictions upon the sales of land, but would insist upon observance of the conditions that the FULL VALUE CONFERRED BY THE GRANTING ACTS BE SECURED TO IT.

Since the last report the lower court, instead of observing the mandate of the Supreme Court and rendering a decree which would maintain the status quo, pending action by Congress, undertook to render a decree enjoining the Railroad Company absolutely from ever disposing of the timber apart from the land. As this decree was inconsistent with the mandate of the Supreme Court, and as acquiescence therein would deprive the Company of the value of the grant represented by the timber on the lands, our counsel appealed therefrom to the Court of Appeals. That court certified the matter to the Supreme Court, where the case now pends. It will probably be heard and decided at the next October term.

In the meantime Congress construing, or rather misconstruing, the decision of the Supreme Court as establishing that the value of the land grant to the Railroad Company could not exceed \$2.50 per acre, and as authorizing Congress to take back the grant on the payment of such value

to the grantee, has passed an act purporting to re-vest in the United States the title to the unsold lands and providing for the payment to the Railroad Company for such lands at the rate of \$2.50 per acre. The act provides for the sale of the timber apart from the land, and for the sale of the land to actual settlers when the timber has been severed, thus recognizing the contention of the Railroad Company that the timber could and should be disposed of before offering the land for sale for settlement purposes. The moneys so received from the sale of the lands and timber are to be set aside in a special fund to be used first in payment of the amount which may be found due to the Railroad Company, and the balance to be divided between the State of Oregon, and counties traversed by the Railroad Company and the United States. The Attorney-General is directed to bring a suit against the Railroad Company to have determined the amount of moneys which have been received by the Railroad Company on account of any of the granted lands, from past sales or leases or otherwise, and which should be charged against it as a part of the "full value" secured to the grantee by the granting acts as interpreted by the Supreme Court. It is further provided that the United States shall pay to the State of Oregon the taxes levied against the lands since the forfeiture decision of the lower court in 1913; and the Attorney-General is directed to have determined in the above mentioned suit the right of the United States to charge this payment of taxes against the Railroad Company.

Our counsel believe that this act of Congress is inconsistent with the decision of the Supreme Court, unauthorized by the mandate of that court, and in violation of the property rights of the Railroad Company. Appropriate proceedings will therefore be taken to test its validity. It is hoped, however, that in deciding the case now pending before it the Supreme Court will so define the rights of the Railroad Company under the granting acts as to render further litigation unnecessary and bring about a speedy settlement. Our counsel will endeavor to secure the co-operation of counsel for the Government with this end in view.

The position of the Southern Pacific Company, which we believe finds ample support in the decision of the Supreme Court as well as in the granting acts, is that the grantee has full and complete title to the lands and all that thereon is, subject only to the obligation that, when it comes to sell the lands, it must sell them to actual settlers at prices and in quantities not exceeding the prescribed maximums. It has a right to sell or dispose of the timber apart from the land, unless such severance of the timber would prevent sales of the land to the persons and upon the terms prescribed. The recent act of Congress confirms our belief that sale of the timber by the grantee apart from and before sale of the lands would not be a violation of the restrictions which the granting acts imposed upon sales of the lands, and hence that the right to so dispose of the timber is a right which forms part of the value of the grant and cannot be ignored by Congress.

PURCHASE OF CENTRAL PACIFIC RAILWAY COMPANY EUROPEAN LOAN BONDS.

The 1911 report contained the following statement:

"To provide funds for double tracking, for additions and betterments, for extensions to its railroads, and for other corporate purposes, the Central Pacific Railway Company executed an indenture dated March 1, 1911, securing an issue of bonds designated as its 'Four Per Cent. Thirty-five Year European Loan of 1911,' limited to an aggregate principal amount of two hundred and fifty million French Francs, or nine million, eight hundred and seventy-five thousands Pounds Sterling. The bonds so authorized mature March 1, 1946, and bear interest from the first day of March, 1911, at the rate of four per cent. per annum, payable semi-annually on March first and September first in each year. Bonds to the amount of 250,000,000 French Francs were issued during the year, of which 200,000,000 Francs were delivered prior to June 30, 1911."

During the year, arrangements were made with bankers for the purchase by the Southern Pacific Company, at a very satisfactory price, of such bonds of the above issue as could be secured. To date of going to press, bonds to the amount of 116,835,500 French Francs, equivalent to 22,555,093.27, have been purchased.

GENERAL.

Dividends on the capital stock of your Company were declared during the year, payable as follows:

1½ per cent. paid January 2, 1916.....	\$4,090,131.86
1½ per cent. paid April 1, 1916.....	4,090,162.94
1½ per cent. payable July 1, 1916.....	4,090,168.58
1½ per cent. payable October 2, 1916.....	4,090,168.58
Total	\$16,360,631.96

The Southern Pacific Railroad Company of Mexico continued to suffer during the year from revolutionary disturbances. The cost of property destroyed as a result of these disturbances, from the beginning of the Madero Revolution, in 1910, to June 30, 1916, is estimated at 5,020,552 pesos, equivalent to \$2,510,276. On account of these losses, claims amounting to 287,953 pesos were filed with the Madero Government, and approved, but have not yet been paid. No further claims for property losses have been filed owing to unsettled conditions. In addition to the above, the Company has claims for freight and passenger services performed, for rental of road and equipment, and for material furnished to or confiscated by the various military authorities, amounting to 9,284,000 pesos. Bills for this amount (less 434,000 pesos received on account), and bills for the property losses mentioned above, will be filed as soon as conditions permit. During the year only such maintenance work has been done as was absolutely necessary to render it possible to operate trains over those portions of the line which were from time to time open for traffic.

In addition to the completed lines of railway reported under Properties and Mileage, and the still incomplete line of the Southern Pacific Railroad Company of Mexico, construction is progressing on the lines of the following companies, viz.:

	LENGTH OF PRO- JECTED LINE.	TRACK COM- PLETED.	GRAD- ING COM- PLETED.	GRADING PRO- GRESSING.
	MILES.	MILES.	MILES.	MILES.
COLUSA & HAMILTON RAILROAD: Hamilton to Harrington, Cal.....	61.23	46.66	12.01	2.56
SOUTHERN PACIFIC COMPANY: Eugene to Marshfield, Ore. 120.50 Less placed in operation... 6.37	114.13	113.81	.....	.32

Under the pension system put into effect on January 1, 1903, eight hundred and twenty-two employees are carried on the pension rolls of the rail and water lines. The payment to them for the year amounted to \$349,933.20.

In December, 1915, your Company took advantage of an opportunity to sell its stock in the Pacific Mail Steamship Company instead of waiting for the liquidation of the Company, which was contemplated at that time.

The Board announces with sorrow the death, on May 1, 1916, of Mr. Charles W. Harkness, who served as a Director and as a member of the Executive Committee from April 9, 1913, to the time of his death.

Mr. F. D. Underwood was elected a Director on November 11, 1915, to fill the vacancy caused by the resignation of Mr. C. N. Bliss; Mr. W. B. Scott was elected a Director on April 5, 1916, to fill the vacancy caused by the death of General Thomas H. Hubbard; and Mr. Edward S. Harkness was elected a Director and a member of the Executive Committee on June 8, 1916, to fill the vacancies caused by the death of Mr. Charles W. Harkness.

The Board is pleased to express to the officers and employees of the Company its appreciation of their loyal and efficient service, the results of which are evidenced in the foregoing statements showing financial and other operations.

By order of the Board of Directors,
JULIUS KRUTTSCHNITT,
Chairman of the Executive Committee.

THE ATCHISON, TOPEKA & SANTA FE RAILWAY COMPANY—TWENTY-FIRST ANNUAL REPORT

SEPTEMBER 12, 1916.

To the Stockholders:

Your Directors submit the following report for the fiscal year July 1, 1915, to June 30, 1916, inclusive.

The Lines comprising the Atchison System, the operations of which are embraced in the following statements, are as follows:

	June 30, 1916.	June 30, 1915.
Atchison, Topeka & Santa Fe Railway.....	8,647.87 miles.	8,513.48 miles.
Rio Grande, El Paso & Santa Fe Railroad..	20.22 "	20.22 "
Gulf, Colorado & Santa Fe Railway.....	1,937.59 "	1,937.71 "
Panhandle & Santa Fe Railway.....	665.02 "	665.02 "
	11,270.70 "	11,136.43 "

Increase during the year 134.27 miles.

The average mileage operated during the fiscal year ending June 30, 1916, was 11,246.80 miles, being an increase of 132.28 miles as compared with the average mileage operated during the preceding fiscal year.

In addition to lines covered by this report the Company controls, through ownership of stocks and bonds, other lines aggregating 161.33 miles, and is interested jointly with other companies in 606.52 miles.

For detailed statement of present mileage and of changes in mileage since last Annual Report.

INCOME STATEMENT.

The following is a summary of the transactions of the System for the years ending June 30, 1915 and 1916:

	1915.	1916.
Operating Revenues	\$117,665,587.46	\$133,762,392.24
Operating Expenses	76,091,553.69	83,730,960.35
Net Operating Revenue	\$41,574,033.77	\$50,031,431.89
Taxes	5,497,316.77	6,210,366.13
Uncollectible Railway Revenues.....	25,316.43	41,072.53
Operating Income	\$36,051,400.57	\$43,779,993.23
Other Income	2,997,150.47	3,307,129.56
Gross Corporate Income.....	\$39,048,551.04	\$47,087,122.79
Rentals and Other Charges.....	2,131,942.03	1,977,654.79
	\$36,916,609.01	\$45,109,468.00
Interest on Bonds, including accrued interest on Adjustment Bonds.....	12,785,747.10	12,529,733.40

Net Corporate Income (representing amount available for dividends and surplus and for necessary but unproductive or only partially productive expenditures).....

\$24,130,861.91 \$32,579,734.60

From the net corporate income for the year the following sums have been deducted:

DIVIDENDS ON PREFERRED STOCK—	
No. 35 (2½%) paid Feb. 1, 1916.....	\$3,104,342.50
No. 36 (2½%) paid Aug. 1, 1916.....	3,104,342.50
	\$6,208,685.00
DIVIDENDS ON COMMON STOCK—	
No. 41 (1½%) paid Sept. 1, 1915.....	\$3,023,377.50
No. 42 (1½%) paid Dec. 1, 1915.....	3,114,277.50
No. 43 (1½%) paid Mar. 1, 1916.....	3,162,427.50
No. 44 (1½%) paid June 1, 1916.....	3,182,197.50
	\$12,482,280.00

Appropriation for Fuel Reserve Fund.....	55,481.62
California-Arizona Lines Bonds Sinking Fund	14,197.46
Income Appropriated for Investment in Physi- cal Property	7,000,000.00
	25,760,644.08

Surplus carried to Profit and Loss..... \$6,819,090.52

Surplus to credit of Profit and Loss June 30, 1915	\$20,581,221.91
Additions to Profit and Loss Account (Sun- dry Adjustments)	202,638.50
	\$20,783,860.41

Discount on Capital Stock and Bonds sold during the year	737,162.50
Surplus appropriated for Investment in Physi- cal Property	179,480.42
	\$916,642.92

Surplus to credit of Profit and Loss June 30, 1916..... \$19,867,217.49

Income from sources other than earnings from operation consisted of interest on cash in banks and sums collected as interest and dividends upon bonds and stocks of companies, the operations of which are not included in the System accounts.

During the fiscal year the sum of \$1,200,000 in cash was received as the net proceeds of sale of land embraced in the Santa Fe Pacific Land Grant, but this was directly written off the book value of Railroads, Franchises and Other Property and the transaction does not appear in the Income Account.

CAPITAL EXPENDITURES AND ADJUSTMENT OF BOOK VALUES.

The total charges to Capital Account, as shown by the General Balance Sheet, page 32, at June 30, 1916, aggregated \$715,477,622.71 as compared with \$683,855,314.09 at June 30, 1915, an increase during the year of \$31,622,308.62, which analyzes as follows:

Crosbyton-Southplains R. R.	\$ 470,092.36
Eastern Ry. of New Mexico	7,176.24
Grand Canyon Ry.	51,486.48
Laton & Western R. R.	179,000.00
Minkler Southern Ry.	69,009.31
Oil Fields & Santa Fe Ry.	150,309.29
Union Passenger Depot Co. of Galveston	889.52
Verde Valley Ry.	134,000.00
	\$1,061,963.20

Additions and Betterments—System Lines:

Fixed Property	\$ 4,502,488.71
Additional Equipment	2,015,541.16
Betterments to Equipment	48,332.04
	6,566,361.91

Fuel Lands and Other Properties:

Fuel Lands	\$ 1,284,500.00
Real Estate held for future use	530,409.13
Tie and Timber Lands	9,224.29
Miscellaneous Items	39,503.38
	1,863,636.80

Other Investments	2,357,767.59
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Total Charges	\$11,849,729.50
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Adjustment of Book Values:

Additions and Betterments written off in years 1901 to 1908, both inclusive, now reinstated in conformity with the present accounting rules of the Interstate Commerce Commission	\$21,066,685.78
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Less:

California, Arizona & Santa Fe Ry.	\$ 2,517.95
Santa Fe Pacific R. R.—Land Sales	1,200,000.00
Western Oklahoma Ry.—Land Sales	800.50
Ice Plant, Belen	12,000.00
Ice Plant, San Bernardino	64,293.03
Santa Barbara Tie & Pole Co.	14,495.18
	\$1,294,106.66
	19,772,579.12

Net Increase in Capital Account during the year.... \$31,622,308.62

For details of Additions and Betterments by accounts see statement on page 40.

The item of \$2,015,541.16 for "Additional Equipment" analyzes as follows:

37 Locomotives	\$1,204,353.20
1,657 Freight-Train Cars	1,848,385.86
4 Passenger-Train Cars	2,759.40
605 Miscellaneous Work Cars	101,210.76
	\$3,156,709.22

Less—Value of Equipment retired during the year as follows:

63 Locomotives	\$413,484.61
1,242 Freight-Train Cars	497,545.34
27 Passenger-Train Cars	106,068.60
Motor Equipment of Cars	18,000.00
1 Car Float	42,661.44
327 Miscellaneous Work Cars	54,896.96
Miscellaneous Adjustments	8,511.11
	\$1,141,168.06
	\$2,015,541.16

The 605 miscellaneous work cars included in "Additional Equipment" and the 1,242 freight-train cars reported as retired include 588 cars, which, being permanently assigned to work service, were relettered in work service equipment series during the year and transferred from freight equipment to work service equipment at their depreciated value at time of relettering. The equipment reported as retired includes 2 locomotives, 10 freight-train cars and 1 work car leased from the Rocky Mountain and Santa Fe Railway Company on July 1, 1915, which were withdrawn from service during the year.

In addition to the equipment reported retired as above, 2 locomotives and 1 freight-train car leased from the Oklahoma Central Railroad Company, were also retired during the year and liability therefor included in Other Unadjusted Credits in the General Balance Sheet.

MAINTENANCE OF EQUIPMENT.

The following statement shows the sums charged to Operating Expenses for Maintenance of Equipment during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897	6,443.81	\$3,443,884.82	\$534.45
1898	6,936.02	4,659,277.99	671.75
1899	7,032.62	4,810,795.64	684.07
1900	7,341.34	5,267,832.40	717.56
1901	7,807.31	6,257,456.57	801.49
1902	7,855.38	7,864,951.25	1,001.22
1903	7,965.13	8,510,543.09	1,068.48
1904	8,179.59	10,006,135.41	1,223.31
1905	8,305.40	10,914,864.47	1,314.19
1906	8,433.99	10,720,040.43	1,271.05
1907	9,273.15	11,779,846.64	1,270.32
1908	9,415.01	14,246,621.44	1,513.18
1909	9,794.86	13,903,897.37	1,419.51
1910	9,916.33	15,560,047.44	1,569.13
1911	10,350.13	16,686,145.45	1,612.17
1912	10,627.92	16,521,231.41	1,554.51
1913	10,750.31	19,415,224.63	1,806.02
1914	10,908.52	19,100,724.51	1,750.99
1915	11,114.52	19,764,535.40	1,778.26
1916	11,246.80	20,514,960.18	1,824.07

For the year ending June 30, 1916, maintenance charges, including renewals and depreciation, averaged as follows:

Per locomotive	\$5,007.86
Per locomotive mile	.1672
Per freight car	121.01
Per freight car mile	.0102
Per passenger car, including mail and express	1,418.50
Per passenger car mile	.0147

The foregoing average maintenance charges include a proportion of unlocated expenditures for Maintenance of Equipment charged to Superintendence, Shop Machinery, Injuries to Persons, Insurance, Stationery and Printing, Other Expenses, and Maintaining Joint Equipment at Terminals. Refrigerator cars are not taken into consideration in arriving at freight car averages, such cars being operated by The Santa Fe Refrigerator Despatch Company, which bears the expense of their maintenance.

A statement of the locomotives in service and of their tractive power will be found on page 48.

MAINTENANCE OF WAY AND STRUCTURES.

The following statement shows the sums charged to Operating Expenses for Maintenance of Way and Structures during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897	6,443.81	\$6,282,923.15	\$975.03
1898	6,936.02	8,281,397.88	1,193.97
1899	7,032.62	7,672,107.62	1,090.93
1900	7,341.34	6,354,372.10	865.56
1901	7,807.31	6,433,840.36	824.08
1902	7,855.38	6,141,466.39	781.82
1903	7,965.13	9,304,892.04	1,168.20
1904	8,179.59	9,170,234.07	1,121.11
1905	8,305.40	11,385,418.33	1,370.85
1906	8,433.99	12,475,407.97	1,479.18
1907	9,273.15	15,286,062.66	1,648.42
1908	9,415.01	14,120,828.02	1,499.82
1909	9,794.86	12,884,406.81	1,315.43
1910	9,916.33	17,807,136.20	1,795.74
1911	10,350.13	16,059,786.90	1,551.65
1912	10,627.92	16,076,833.75	1,512.70
1913	10,750.31	18,054,418.03	1,679.43
1914	10,908.52	15,308,780.25	1,403.38
1915	11,114.52	16,514,467.89	1,485.85
1916	11,246.80	19,518,635.03	1,735.48

COMPARISON OF OPERATING RESULTS.

The following is a statement of revenue and expenses of the System for the fiscal year ending June 30, 1916, in comparison with the previous year:

	Year Ending June 30, 1916.	Year Ending June 30, 1915.	Increase or Decrease.
OPERATING REVENUES:			
Freight	\$91,432,428.97	\$80,504,393.33	\$10,928,035.64
Passenger	31,568,600.55	27,823,063.87	3,745,536.68
Mail, Express, and Miscellaneous	10,761,362.72	9,338,130.26	1,423,232.46
Total Operating Revenues	\$133,762,392.24	\$117,665,587.46	\$16,096,804.78
OPERATING EXPENSES:			
Maintenance of Way and Structures	\$19,518,635.03	\$16,514,467.89	\$3,004,167.14
Maintenance of Equipment	20,514,960.18	19,764,535.40	750,424.78
Traffic	2,755,735.84	2,649,174.86	106,560.98
Transportation—Rail Line	38,281,053.78	34,827,705.34	3,453,348.44
General	2,904,040.13	2,476,595.20	427,444.93
Transportation for Investment—Cr.	243,464.61	140,925.00	102,539.61
Total Operating Expenses	\$83,730,960.35	\$76,091,553.69	\$7,639,406.66
Net Operating Revenue	\$50,031,431.89	\$41,574,033.77	\$8,457,398.12
Ratio of Operating Expenses to Operating Revenues	62.60	64.67	—2.07

Credits in italics.

The following averages are deducted from tables set forth on pages 43 and 46.

The average tons of freight (revenue and company) per loaded car mile increased from 19.71 to 19.96, or 1.27 per cent.

The average tons of freight (revenue and company) carried per freight-train mile (freight and mixed) increased from 442.04 to 468.10, or 5.90 per cent.

The average freight revenue per freight-train mile increased from \$3.55 to \$3.74, or 5.35 per cent.

The average passenger revenue per passenger-train mile increased from \$1.09 to \$1.18, or 8.26 per cent.

The average passenger train revenue per passenger-train mile increased from \$1.37 to \$1.49, or 8.76 per cent.

The tons of freight carried one mile (revenue and company) increased 1,444,330,257, or 14.41 per cent., while miles run by freight cars (loaded and empty) in freight and mixed trains increased 62,769,949, or 8.43 per cent., and the mileage of such trains increased 1,818,402, or 8.03 per cent.

The number of passengers carried one mile increased 242,785,385, or 18.10 per cent., while miles run by passenger cars in passenger and mixed trains increased 15,232,301, or 10.14 per cent., and the mileage of such trains increased 1,243,013, or 4.86 per cent.

While freight operating revenues increased 13.57 per cent., the freight service rendered, as measured by tons transported one mile, increased 14.41 per cent.; and while earnings from passengers carried increased 13.46 per cent., the passenger service rendered, as measured by passengers carried one mile, increased 18.10 per cent.

The following is a consolidated statement of the business of the System for each fiscal year during the period since January 1, 1896:

Fiscal Year Ending June 30.	Average Miles Operated.	Gross Revenues, Including Income from Other Sources.	Expenses, Including Taxes, Rentals and Other Charges.	Interest on Bonds.	Net Corporate Income.
1897 (18 mos.)	6,443.81	\$44,532,628.99	\$36,038,455.30	\$8,440,387.91	\$53,785.78
1898	6,936.02	39,396,126.41	30,513,553.17	7,045,988.30	1,836,584.94
1899	7,032.62	40,762,933.47	29,332,964.11	7,241,972.00	4,187,997.36

1900	7,341.34	46,498,899.04	29,414,427.56	7,345,166.50	9,739,304.98
1901	7,807.21	54,807,379.78	34,502,039.87	7,830,810.83	12,474,529.08
1902	7,855.38	60,275,944.33	36,272,432.45	8,438,985.00	15,564,526.88
1903	7,965.13	63,668,390.99	40,635,576.48	9,134,485.24	13,898,329.27
1904	8,179.59	69,419,975.41	44,641,434.10	9,418,770.00	15,359,771.31
1905	8,305.40	69,189,739.65	47,835,883.50	9,611,510.09	11,742,346.06
1906	8,433.99	79,390,749.05	51,035,355.71	10,622,184.22	17,733,209.12
1907	9,273.15	94,436,574.68	61,779,916.16	11,487,934.70	21,168,723.82
1908	9,415.01	91,289,770.61	65,031,582.67	12,579,301.77	13,678,886.17
1909	9,794.86	95,424,091.89	61,458,019.13	13,548,081.93	20,417,990.83
1910	9,916.33	107,543,250.16	75,133,314.54	11,984,151.36	20,425,784.26
1911	10,350.13	109,772,481.69	75,689,094.83	12,712,319.31	21,371,067.55
1912	10,627.92	110,322,328.13	77,001,227.38	13,660,859.50	19,660,241.25
1913	10,750.31	119,411,875.94	83,432,816.21	13,825,325.40	22,153,734.33
1914	10,908.52	113,284,122.98	80,213,746.06	12,886,412.23	20,183,964.69
1915	11,114.52	120,662,737.93	83,746,128.92	12,785,747.10	24,130,861.91
1916	11,246.80	137,069,521.80	91,960,053.80	12,529,733.40	32,579,734.60

The following statement shows the gross operating revenues of the System (exclusive of income from other sources) per mile of road operated for each fiscal year since July 1, 1896:

Year Ending June 30.	Gross Operating Revenues.	Average per Mile of Road.
1897	\$30,621,230.10	\$4,752.04
1898	39,214,099.24	5,653.69
1899	40,513,498.63	5,760.80
1900	46,232,078.23	6,297.49
1901	54,474,822.61	6,977.41
1902	59,135,085.53	7,527.97
1903	62,350,397.28	7,827.92
1904	68,171,200.18	8,334.31
1905	68,375,837.25	8,232.70
1906	78,044,347.25	9,253.55
1907	93,683,406.91	10,102.65
1908	90,617,796.38	9,624.82
1909	94,265,716.87	9,624.00
1910	104,993,194.67	10,587.91
1911	107,565,115.62	10,392.63
1912	107,752,359.91	10,138.61
1913	116,896,251.98	10,873.75
1914	111,109,769.86	10,185.60
1915	117,665,587.46	10,586.65
1916	133,762,392.24	11,893.37

The following statement shows the development of the freight and passenger revenues of the System since July 1, 1896:

Year Ending June 30.	Freight Revenue.	Passenger Revenue.
1897	\$22,067,686.77	\$5,574,288.31
1898	28,588,716.76	7,347,361.59
1899	29,492,586.65	8,126,141.85
1900	33,729,332.83	9,334,661.57
1901	39,052,557.43	11,678,017.25
1902	41,815,607.05	13,439,384.57
1903	44,622,438.71	13,469,985.78
1904	47,762,653.23	15,433,773.63
1905	47,408,982.36	16,045,380.27
1906	54,598,902.82	18,013,988.56
1907	65,500,309.42	21,171,629.08
1908	61,848,638.51	21,643,427.49
1909	64,212,638.10	22,734,505.32
1910	71,194,055.59	25,437,181.98
1911	71,787,200.89	27,204,867.66
1912	71,529,574.67	27,453,525.41
1913	78,190,923.18	29,425,922.44
1914	73,638,388.01	28,497,232.68
1915	80,504,393.33	27,823,063.87
1916	91,432,428.97	31,568,600.55

PROPERTY INVESTMENT AND RATE OF RETURN.

The development of the Company's business and of its efficiency have been due principally to the very large expenditures (over \$318,000,000) which have been made in the extension and improvement of the property since January 1, 1896. In order to make such expenditures, your Company has raised since 1896 over \$232,000,000 of "new money" by the sale of capital stock and of bonds which are now outstanding or which (in the case of many of the Convertible Bonds sold) are represented by Common Stock now outstanding.

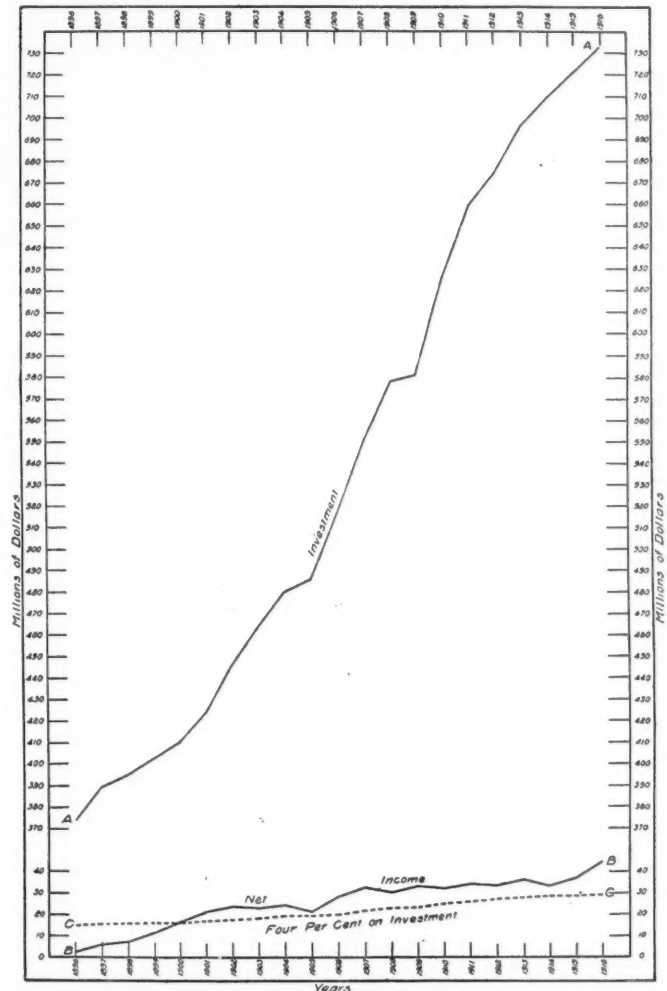
The following statement shows, for each year, the amount of investment, the amount of net income applicable to bond interest, dividends, improvement of property and strengthening of credit, and the rate of return which such net income represents on the amount of the investment.

Year Ending June 30.	Property Investment.*	Income Applicable to Bond Interest, Dividends, Improvement of Property and Strengthening of Credit.†	Per Cent. Income of Property Investment.
1896 (6 months).....	\$373,260,004.67	\$2,432,870.06	.65
1897	389,118,442.87	6,070,364.45	1.56
1898	394,170,563.40	8,871,947.26	2.25
1899	402,388,222.21	11,409,315.36	2.84
1900	409,670,087.91	17,064,850.91	4.17
1901	423,734,716.52	21,196,714.38	5.00
1902	445,314,062.19	23,921,018.14	5.37
1903	463,230,180.22	23,032,814.51	4.97
1904	479,324,339.26	24,778,541.31	5.17
1905	485,497,374.42	21,353,856.15	4.40
1906	515,557,913.70	28,355,393.34	5.50
1907	550,693,087.37	32,724,274.07	5.94
1908	577,433,073.23	25,633,510.34	4.44
1909	580,297,115.78	33,523,437.28	5.78
1910	625,401,211.54	32,387,712.39	5.18
1911	658,156,763.91	34,102,511.86	5.18
1912	673,465,876.49	33,321,100.75	4.95
1913	695,730,983.22	36,078,744.55	5.19
1914	709,304,446.55	33,070,376.92	4.66
1915	720,792,460.35	36,928,030.11	5.12
1916	732,403,747.71	45,312,106.50	6.19
Annual Average ..	\$538,330,698.74	\$25,930,219.06	4.82

*The amounts shown above as "Property Investment" include sums invested in material and supplies. For this reason and also because expenditures for additions and betterments "written off" in the years 1901 to 1908 inclusive have been reinstated in the property account, the above figures for the years prior to 1916 are not the same as shown in the corresponding table of the annual report for the previous year.

†The "Income" shown above is determined after allowing for adjustments made through profit and loss.

The following chart brings out still more clearly the significance of the statement and strikingly depicts the progressive increase in investment which has been necessary to enable the Company to render its public service.



Line "A" is investment in property, including material and supplies.
Line "B" is the net income applicable to bond interest, dividends, improvement of property and strengthening of credit.
Line "C" is the amount of income which would be equivalent to four per cent on the investment shown.

The striking fact emphasized by the foregoing statement is that the earnings on the entire investment, during this, the most prosperous year in the history of the Company, are but little over six per cent., and, even in recent years, average but little more than five per cent. per annum; and it must be borne in mind that of these earnings it is necessary to appropriate a substantial amount each year for additions and betterments to preserve the Company's credit.

The ability of your Company, under the conditions which this statement exhibits, to pay six per cent. on the common stock, is due to the fact that it pays an average of only slightly more than four per cent. on its bonded debt, much of the bonded debt having been created when money could be obtained at or near four per cent.

CAPITAL STOCK AND FUNDED DEBT.

The outstanding Capital Stock (deducting stock in treasury) on June 30, 1915, consisted of:

Common	\$200,489,500.00
Preferred	114,173,730.00
	\$314,663,230.00

Issued during the year:

Common Stock issued in exchange for	
Convertible Bonds retired.....	\$13,823,000.00
Preferred Stock	9,999,970.00
	23,822,970.00

Capital Stock outstanding June 30, 1916:

Common	\$214,312,500.00
Preferred	124,173,700.00
	\$338,486,200.00

The outstanding Funded Debt of the System (deducting bonds in the treasury) amounted on June 30, 1915, to..... \$310,975,282.40

The following changes in the Funded Debt occurred during the year:

Obligations Issued:	
Transcontinental Short Line First Mortgage 4% Bonds	\$5,545,000.00
California-Arizona Lines First and Refunding Mortgage 4½% Bonds	153,071.10
	\$5,698,071.10
Obligations Purchased or Retired:	
Convertible 5% Bonds	\$1,298,000.00
Convertible 4% Bonds	13,823,000.00
	15,121,000.00
Decrease of Funded Debt.....	\$9,422,928.90
Total System Funded Debt outstanding June 30, 1916.....	\$301,552,353.50

Interest charges for year ending June 30, 1917, will be approximately \$12,268,000 or an average monthly charge of about \$1,022,333. In making this approximation, exchanges of Convertible Bonds for Common Stock made since June 30, 1916, aggregating \$737,000, are considered.

TREASURY.

Neither this Company nor any of its auxiliaries has any notes or bills outstanding.

The Company held in its treasury on June 30, 1916, \$44,364,922.25 cash, and had available \$5,281,000 General Mortgage Bonds, including bonds not yet certified by the Trustee. The Company also has in the treasury unpledged a large amount of stocks and bonds of other companies, of which part are carried in the balance sheet as Investments and part are included under Railroads, Franchises and Other Property.

During the year \$10,000,000 Preferred Capital Stock and \$5,545,000 Transcontinental Short Line First Mortgage Four Per Cent. Bonds were sold for cash, realizing \$14,807,837.50.

FUEL RESERVE FUND.

The fund has been increased during the year by appropriations of income, as follows:

Amount to credit of Fund June 30, 1915.....	\$1,832,834.80
Added during the year	55,481.62

In Fund June 30, 1916.....	\$1,888,316.42
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CROSBYTON-SOUTHFLAINS RAILROAD.

This line, 38.45 miles in length, extending from Lubbock, Texas, to Crosbyton, Texas, in the so-called "Plains Country," was acquired during the year. An extension under its charter southwest from Lubbock of about 65 miles is now under construction and will, it is expected, be completed during the current fiscal year.

LATON AND WESTERN RAILROAD.

The capital stock of the company owning this line, extending from Laton to Lanare, Kings County, California, a distance of 17 miles, which has been operated by your Company under lease since February 22, 1911, was acquired during the year. This line while not profitable at present will it is hoped, with the development of the territory it serves, ultimately prove valuable.

MINKLER SOUTHERN RAILWAY.

An extension of this line, from Lindsay to Porterville, California, a distance of about 12 miles, through a rich orchard country, is under construction, and it is expected will be completed and placed in operation before the close of the current fiscal year.

NORTH TEXAS AND SANTA FE RAILWAY.

This company has been organized to construct a line from Hansford, Hansford County, Texas, to a point of connection with your Company's main line at or near Shattuck, Ellis County, Oklahoma, a distance of about 85 miles. The new line will serve a rapidly developing and rich agricultural territory, and will, it is expected, be a valuable feeder to the System.

NORTHWESTERN PACIFIC RAILROAD COMPANY.

Your Company, as indicated in previous reports, has a half interest in the Northwestern Pacific Railroad Company, which on July 1, 1915, completed and placed in operation the line from Willets to Shively, a distance of 105.04 miles, making possible through train service between Eureka on the North and San Francisco Bay on the South. The result of the Company's operations for the last fiscal year, the first since the completion of the new line, show all fixed charges earned, which, all things considered, is as much as could be expected.

OIL FIELDS & SANTA FE RAILWAY.

This line, which was under construction at the date of the last annual report, was completed during the year and its operations since January 1, 1916, have been included in the System accounts. It traverses an important section of the Mid-Continent oil fields and brings a large business to your main lines.

COLINE OIL COMPANY.

The capital stock of this Company, owning valuable oil lands and leases in the Healdton Field in Oklahoma, was acquired during the year. Since the acquisition of its stock by your Company the Coline Company has acquired the oil lands and leases formerly owned by the Gulf, Colorado and Santa Fe Railway Company in the Wheeler Field, near Ardmore, Oklahoma, including a pipe line from Wheeler to Ardmore. The control of this company assures an adequate supply of fuel oil for your Company's lines in this territory for some years to come.

TAXES.

Tax accruals for the fiscal year 1916 were \$6,210,366.13 and for the fiscal year 1915 they were \$5,497,316.77, or an increase for 1916 of \$713,049.36. Assessments were held about as they were in the preceding year. This large increase in tax payments aside from the increase in Federal taxes of \$100,856.80 was due almost wholly to increased tax rates in four states, Oklahoma, Texas, Kansas and Arizona.

In previous reports your attention has been directed to the reckless increase of public expenditures and to the efforts that were being made to bring the people back to more conservative views. In several of the states in which your Company operates there are substantial indications that the tide has at least been slowed down. As our assessments of 1916 will be about the same as in 1915 the outlook shows some improvement.

Your officials are doing more than ever before to prevent the wasteful and improper expenditure of public money. They are arousing a feeling against extravagance and they are encouraging the organization of the taxpayers so that their dissatisfaction will not waste itself in profitless scolding. One of our concrete aims is the enactment of workable and effective tax limit laws which will keep the increases from year to year within reasonable bounds. Such a law has been secured in New Mexico.

REINSTATEMENT OF PROPERTY EXPENDITURES.

The Federal Physical Valuation Law, approved March 1, 1913, calls, amongst other things, for the cost of property of common carriers, and so far as it is possible to do so such cost is to be ascertained in accordance with the rules laid down in the Classification of Investment in Road and Equipment as prescribed by the Interstate Commerce Commission effective July 1, 1914. Under these rules expenditures for road and equipment, regardless of the sources from which the funds were derived, are required to be stated as a part of the investment in road and equipment so long as the property units representing them remain in use. For many years past it has been the policy of your Company to make liberal appropriations of income and surplus for additions and betterments, and prior to July 1, 1907, it was the practice to reduce the property account in the amount of such appropriations by charge to income or surplus. In order that the investment in the property of your Company may be more nearly stated in accordance with the present accounting rules above referred to, the expenditures represented by these appropriations, aggregating \$19,077,703.33, have been reinstated during the year covered by this report. The present rules of the Commission also provide for carrying as a part of the property

account expenditures for improvements on leased railway property when such property is held under long-term leases, and, in harmony with this provision, expenditures for improvements on leased property, aggregating \$2,032,378.50, have likewise been reinstated. The credits arising from these reinstatements of property assets are included in the general balance sheet under "Corporate Surplus" in the account "Additions to Property through Income and Surplus."

DEATH BENEFITS TO EMPLOYEES.

Your Board has put into operation for two years beginning July 1, 1916, a plan of paying benefits to the families of employees dying while in the service of the Company. The details of the plan are sufficiently explained by the following extract from the circular announcing the plan to employees:

"Beginning on July 1, 1916, the Company proposes to pay to such party, or parties, as such employee, dying while in its service and who has been in its employ for two or more years continuously, may have designated in writing as his beneficiary or beneficiaries, or, in case of failure to make such designation, then to his next of kin dependent on him, a sum equal to five per cent of the salary or wage received by him during the twelve months immediately preceding his death, multiplied by the number of years of continuous service, in accordance with the 'examples' hereafter set forth, provided that the maximum amount to be so paid shall be one year's pay, but shall in no case exceed \$3,000.00; and provided further that the minimum shall be \$250.00.

"The above plan is put forth in the hope that conditions may enable us to continue it in effect for the future, but it must be distinctly understood that at this time the Company intends to try out such plan for two years only, and distinctly reserves the right at any time after the expiration of such two-year period to cancel or modify all or so much of the arrangement as may seem necessary or expedient to it.

EXAMPLES:

"A has been in service of Company 2 years; salary or wage last year \$75 per month; at his death his beneficiaries would be entitled to 5 per cent of \$900 for each year—\$45—or \$90 for the two years, but the minimum here applies and the amount to be paid is \$250.00.

"B has been in service 6 years; salary or wage last year \$1,200; at his death his beneficiaries would be entitled to 5 per cent. of \$1,200 for each year, or \$360.00.

"C has been in service 20 years; salary or wage last year \$2,000; his beneficiaries would consequently be entitled to that full amount.

"D has been in service 16 years; salary or wage last year \$4,000; his beneficiaries would be entitled to 80 per cent. of \$4,000, or \$3,200, but the maximum here applies and the amount paid would be \$3,000.00."

GENERAL.

Close analysis of operations for the year clearly indicates the enhanced earnings to be almost wholly due to the war in Europe. Even things apparently remote can be traced to this source. On the Pacific coast there is no shipping for Atlantic ports, resulting of course in greatly increased tonnage by rail—in Arizona and New Mexico the copper and zinc industries have had abnormal stimulation—the demand for foodstuffs has produced large prices for a heavy grain crop, thus creating large purchasing power—the oil industry (of great and increasing importance) has felt the interruption of supplies from old world sources and the enormous increase in the use of gasoline—in fact, business of all kinds has been stimulated to such an extent that there have practically been no dull periods during the entire year. So abnormal has the business been that it will doubtless be several years before we again reach the volume of the past year.

We have also had the largest passenger traffic in our history, having carried during the year approximately 112,000 passengers to the Pacific coast from points east of the Rio Grande and 144,000 returning.

It is worthy of note also that the Grand Canyon was visited by 78,000 transcontinental passengers.

While the San Francisco and San Diego fairs were the cause of a large part of the passenger travel, the regular patronage of the line is being steadily increased by the growing popularity of Southern California as a resort and playground for both summer and winter. The rates fixed for the tourist were such as to afford little or no profit, but served to attract strangers to a territory, the attractiveness of which was to many a revelation.

This larger business was handled without friction and to the satisfaction of the public. There were periods when there was a little shortage of box cars, but such times were brief, and there would have been no shortage at any time had our connections been able to return our cars promptly, or had there been ships enough on the ocean to handle that which we were prepared to deliver.

The year was marked by the occurrence of three disasters of unusual magnitude.

First: A tropical storm which flooded the City of Galveston, partially destroying the causeway connecting it with the mainland and injuring us in many minor ways.

Second: The explosion at Ardmore, Oklahoma, of a car-load of gasoline, wrecking the station and a large part of the City and killing 46 people.

Third: An extraordinary rainfall in California and Arizona, resulting in the loss of many miles of track and bridges and interrupting business on some lines for a month.

Roughly, these three items resulted in a loss of two and a half millions of dollars, all of which was charged to operating expenses.

During the entire year the Company has been in litigation in the Federal Courts with the State of Oklahoma over that provision in its Constitution which provides for a passenger rate of two cents per mile. The State has already appropriated \$175,000 of the taxpayers' money for the defense of the case and the perpetuation of this iniquitous provision—the Oklahoma Commission has also spent out of its so-called contingent fund a substantial amount for the same purpose. Your Company has also been put to heavy expense in the effort to obtain justice—but the evidence is now all in and, while no decision has yet been rendered, your officers feel confident that it will be in favor of the Company. A similar rate is in force in Kansas and in all probability similar litigation will be necessary in that State.

Thomas P. Fowler, a Director and a member of the Executive Committee from the time of the organization of the Company in 1895, died on October 11, 1915. His study of the problems which confronted the Company in its early days, his knowledge of railroad affairs, his faithful attention to the Company's business, and his constant attendance at the meetings of the Board and the Committee made him a most helpful Director. Your Directors desire to record this expression of sorrow at the loss which they and the stockholders have sustained by his death.

It is with pleasure that your Directors record their appreciation of the faithful and efficient services of the Company's officials and employees.

EDWARD P. RIPLEY,
President.